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AUSTRALIAN AGRICULTURAL EXTENSION CONFERENCE, 1962, REVIEWS, PAPERS, AND REPORTS.

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IN THIS REPORT OF AN AUSTRALIAN TECHNICAL CONFERENCE ON AGRICULTURAL EXTENSION, EMPHASIS IS PLACED ON CASE STUDIES AND RESEARCH APPLICABLE TO PROFESSIONAL EXTENSION WORK, INCLUDING FARMER CONTACTS AND SUCH SUPPORTING ACTIVITIES AS LIAISON WORK AND COURSE WORK IN THE BEHAVIORAL SCIENCES. THE FIRST SECTION DESCRIBES SERVICES IN EACH STATE AND IN THE NORTHERN TERRITORY, NEW GUINEA, AND NEW ZEALAND. THE NEXT THREE SECTIONS COVER COMPARTIVE EXTENSION IN AUSTRALIA, EUROPE, AND THE UNITED STATES, SPECIAL PROBLEMS RELATING TO AUSTRALIAN PASTORAL AND OTHER INDUSTRIES, AND THE WORK AND PROBLEMS OF DISTRICT ADVISORS. THE ROLE AND SIGNIFICANCE OF COMMERCIAL FIRMS AND PRIVATE ADVISORY SERVICES (INCLUDING FARM MANAGEMENT CLUBS) IN FARM MANAGEMENT EXTENSION ARE DOCUMENTED IN THE FIFTH SECTION. OTHER SECTIONS DEAL WITH PROGRAM PLANNING, GROUP METHODS AND DEMONSTRATIONS, TELEVISION AND OTHER MASS MEDIA. THE RELATIONSHIP BETWEEN EXTENSION AND REGULATORY SERVICES AND RESEARCH EXTENSION LIAISON, RESEARCH IN COMMUNICATIONS, ADULT LEARNING, DECISION MAKING, AND PROGRAM EVALUATION, ASPECTS OF PROFESSIONAL TRAINING (HIGHER EDUCATION, INSERVICE TRAINING, INTERNATIONAL AID), AND POSTCONFERENCE REPORTS BY OVERSEAS VISITORS AND ORGANIZING COMMITTEES. ALSO INCLUDED ARE FOUR FIGURES, 35 TABLES, AND NUMEROUS REFERENCES. (LY)

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Australian Agricultural Extension Conference 1962

REVIEWS, PAPERS, AND REPORTS

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COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION
MELBOURNE 1963

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FOREWORD

The Australian Agricultural Extension Conference held at Hawkesbury Agricultural College from August 12 to 17, 1962, was organized under the auspices of the Standing Committee on Agriculture of the Australian Agricultural Council. It was one of a series of technical conferences organized by C.S.I.R.O. on behalf of the Agricultural Council to enable specialists in different scientific disciplines to exchange information about research results and discuss progress in each field of knowledge. A detailed statement of the background and aims of the Conference was recorded in the first Conference Circular, in the following terms:

Background for Conference

1. Increasing consciousness of the problem basic to extension — the varying time taken to adopt different research results
2. Recognition of the need to exchange experience on interstate and interorganizational bases
3. Recognition of the need to develop further the profession of extension, to define qualities needed in extension workers, and to train extension workers accordingly

Aims of Conference

1. To review the existing situation, methods, gaps in our knowledge, and problems of agricultural extension
2. To encourage the exchange of information between extension agencies and between extension workers
3. To contribute to the development of the profession of agricultural extension with a view to improving current extension practice

The Conference was attended by delegates from State government extension services, universities, C.S.I.R.O., and Commonwealth departments, together with representatives from industry. The 165 contributed papers were available in mimeographed form before the Conference, and copies have been deposited in public and university libraries, as well as in libraries of State Departments of Agriculture, to ensure that they are accessible to persons interested in this subject.

The theme of the Conference was centred on reviews, case studies, and research studies which have an application to professional extension work, and officers who attended were actively engaged in extension work or in research bearing upon it. For this purpose, extension embraces not only work concerned directly with farmer contacts, but also supporting activities such as liaison work between research and extension officers and university studies in those social sciences basic to extension work. Each session of the Conference was devoted to one aspect of extension and consisted of the presentation of the main paper on that aspect, a review of all papers contributed to the session, and discussion.

This volume lists the papers contributed to each session and records the reviews together with those papers selected by the Organizing Committee to provide an adequate description of the present state of extension in Australasia as well as to record outstanding developments or contributions. Among these are the papers presented at the Conference by the three visitors from overseas: Mr. A. H. Maunder (Federal Extension Service, U.S. Department of Agriculture), Mr. J. M. A. Penders (Agricultural Advisory Services, Ministry of Agriculture, Netherlands), and Professor Hadley Read (Illinois Cooperative Extension Service, University of Illinois). A post-Conference report prepared by these extension specialists has been included in this volume, together with the report submitted by the Conference Organizing Committee to the Standing Committee on Agriculture.

It is desired to record appreciation of the financial support for the visits of Messrs. Maunder and Penders provided by the Commonwealth Extension Services Grant and the Rural Credits Development Fund of the Reserve Bank, and of the finance provided by the Commonwealth Extension Services Grant which has made the publication of this volume possible.

Agricultural Research Liaison Section, C.S.I.R.O.

February, 1963.

ORGANIZING COMMITTEE

This conference was approved by the Standing Committee on Agriculture of the Australian Agricultural Council in June, 1961, and C.S.I.R.O. was asked to convene it. Accordingly, an Organizing Committee was established, and met in Melbourne on 15th–16th August, 1961. The Organizing Committee comprised:

Dr. D. B. Williams, Officer-in-Charge, Agricultural Research Liaison Section, C.S.I.R.O. (Chairman).

Mr. P. C. Angove, Senior Extension Officer, Department of Agriculture, South Australia.

Mr. C. I. A. Beale, Agricultural Officer, Bank of New South Wales, Sydney.

Mr. C. A. Holland, Chief Extension Officer, Department of Agriculture, Tasmania.

Mr. W. B. Miller, Deputy Director, Department of Agriculture, Victoria.

Mr. A. J. A. Nelson*, Director, Department of Adult Education, University of New England.

Mr. J. N. Potter, Division of Information Services, Department of Agriculture, New South Wales.

Mr. F. L. Shier, Deputy Director, Department of Agriculture, Western Australia.

Mr. A. J. Vasey, Secretary, Animal Production Committee, Melbourne.

Mr. C. W. Winders, Officer-in-Charge, Information Services, Department of Agriculture and Stock, Queensland.

Dr. R. N. Farquhar, Senior Research Liaison Officer, C.S.I.R.O. (Secretary).

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* Mr. Nelson went overseas after the first meeting of the Committee and was therefore unable to take any further part in the organization of the conference.

OPENING ADDRESS

By Dr. H. J. Hynes*

The Chairman, Mr. Doman, Ladies, and Gentlemen:

It is a pleasure to be invited to open this very important conference. I would like to extend a welcome to you all on behalf of our Minister, the Hon. A. G. Enticknap, who has been very pleased to make the facilities of this College available. He has asked me to convey to you his best wishes for the success of the conference.

I am sure you will all agree that the success of any conference of this type depends not only on the quality but also on the number of delegates. We are extremely fortunate at this conference in the breadth of the representation: we have visiting speakers from overseas and delegates from all States of Australia, the Territories, and New Zealand. I would like to extend a special welcome to the overseas visitors: to Mr. Penders, of the Agricultural Advisory Services of the Netherlands; to Mr. Maunder, of the United States Federal Extension Service; to Professor Hadley Read, of the University of Illinois; to Mr. Saxby and Mr. Hughes from New Zealand. With all the talent that is here it can be expected that the deliberations this week will be on a high level and that some very important conclusions will emerge.

This is the second interstate conference concerned with agricultural extension services. The first was a small conference of senior officers convened at Adelaide in 1953. The Adelaide conference had as its aims the discussion of the extension process and the methods used by the various organizations and an examination of related problems.

An important decision of the Australian Standing Committee on Agriculture has been to sponsor a series of specialist technical conferences. This particular one is an outcome of the decision and is the first extension conference in the series. The inclusion of an extension conference in a series of technical conferences is a reflection of a growing awareness of the nature of extension work and of the need to give extension workers the same opportunities of exchanging knowledge as other workers in agriculture. The programme for this conference illustrates the range of the knowledge and skills developed by extension workers and the scope for exchange of knowledge and ideas between them.

Extension work has been a major function of State Departments of Agriculture since their formation. It has never been an easy task. Our predecessors found extension work difficult because Departments had few trained men and because many farmers were hostile to the ideas of scientific agriculture and to the collar-and-tie men who propounded these ideas.

Today we have many more extension officers, but we still do not have enough.

---

* Director, New South Wales Department of Agriculture.

In place of farmer hostility we have a vigorous demand for advice. Our increased and improved services are unable to satisfy our own objectives, the impatience of research workers, or the demands of interested farmers.

In the last ten years it has been very pleasing to see developing in New South Wales, and to an even greater extent in Western Australia, an idea adopted earlier in New Zealand. This development is the banding together of farmers as groups employing their own advisers. Five or six groups are operating or about to commence in New South Wales: they are a fine adjunct to the official extension service.

In the early days of extension work, lack of knowledge was a major factor limiting the effectiveness of extension workers. But some advances were particularly suited to extension, for example the use of superphosphate and the introduction of subterranean clover. New ideas often have to creep in on their knees: the idea of using superphosphate took about 20 years to actually stand up, even though its advantages were so great. Today we count ourselves as more successful in getting ideas adopted. Although expenditure on agricultural research has increased at a greater rate than expenditure on agricultural extension there are still frequent occasions when lack of knowledge hampers extension workers. Those not directly engaged in extension often fail to realize the prevalence of local problems and the amount of re-fitting research that has to be undertaken by extension officers before many research findings are suited to extension and ready for adoption by farmers.

You will hear in the course of this conference of a new experiment in extension resulting from the combined efforts of the C.S.I.R.O. and the New South Wales Department of Agriculture in the Yass Valley survey. Mr. D. V. Walters has been appointed for a period in an experiment in applying ideas arising from the survey. Some Departments, including the New South Wales Department, have made major administrative changes designed to improve coordination between extension officers and to improve extension administration. In New South Wales the regional organization of extension services, developed during the last ten years, has proved very effective.

All Departments have given a great deal of thought to in-service training to maintain competency of extension officers and to improve their extension skills. In this State we have continued and developed extension methods schools. Mr. Parry Brown, Chief of our Division of Information Services, has made a very important contribution to the Department's effectiveness through extension methods training.

One problem that has intrigued me in the course of my duties as an officer of the New South Wales Department of Agriculture is, 'what should be the basic training for an extension officer?' In our own Department the way is open for graduates in agricultural science, veterinary science, rural science, and wool technology, as well as diplomates of the agricultural colleges, to become extension officers; the way is wide open to both graduates and diplomates. But we have often asked ourselves whether it is the most economic use of resources to employ people in extension work who have spent four years in what is virtually a research training.

The position varies between States: some States take the attitude that extension work is primarily a job for graduates; others take the attitude that it is primarily a job for college diplomates. We have taken the view in New South Wales that, because of the combination of scientific training and practical application in the college courses, the diplomate, generally speaking, makes the better extension officer although we have excellent examples of a first-rate job by graduates who have elected to go into extension work.

In New South Wales, while our agricultural colleges were originally set up to train farmers to go on the land, in time it was found that many diplomates went into the Departments of Agriculture and Conservation. We arrived at a stage where we felt that the training in our colleges was neither one thing nor the other and that, to some extent, we were falling between two stools: we were trying to train farmers, and we were trying to produce extension officers. As a result of an enquiry by a committee of specialists in agricultural education it has been decided that the efforts of our two State agricultural colleges (at Hawkesbury and Wagga) will be directed more towards the training of people who will take extension positions in Government Departments and possibly also in commercial firms. To meet the demand for training in practical farm skills in a period of about twelve months, we propose to set up a special course for that purpose at our Yanco Agricultural Research Station, to commence in January, 1963. It seems to me that this question of basic training for extension workers is one that does merit consideration, and I have no doubt it will be one of the problems you discuss.

The large number of papers submitted for this conference has probably embarrassed the Organizing Committee. While appreciating the problems of the Committee, faced with so many papers on such a wide range of subject matter, everyone concerned with extension work will welcome the evidence of widespread thought by extension officers about their objectives and the methods they use. The 1962 extension conference comes at an appropriate time; there is keen interest in more effective extension and an obvious willingness to try new methods. It is not to be expected that delegates will arrive at defined and agreed answers to the problems of extension workers; rather we hope that they will increase their knowledge of the techniques and of the factors influencing the effectiveness of extension work.

We also expect that the conference will be a stimulus to all Australian extension workers, whether they be present in person or whether they be influenced by the written proceedings and delegates' reports.

This conference, with the excellent response to the opportunity to submit papers and the large attendance, will serve as a reference point for possible future extension conferences. I feel that the Organizing Committee should be congratulated on the arrangements which have been set in train.

I wish you every success and I have much pleasure in declaring this conference open.

SECTION I

Agricultural Extension Services

LIST OF PAPERS

PAPER NO.

1. Agricultural Extension Services in New South Wales.
2. Agricultural Extension Services in Victoria.
3. Agricultural Extension Services in Queensland.
4. Agricultural Extension Services in South Australia.
5. Agricultural Extension Services in Western Australia.
6. Agricultural Extension Services in Tasmania.
7. History and Development of Agricultural Extension in the Territory of Papua and New Guinea. *By* J. C. Lamrock.
8. Agricultural and Pastoral Extension Services in the Northern Territory. *By* W. M. Curteis and G. A. Letts.
9. Commonwealth Financial Assistance for State Extension Services. *By* Commonwealth Department of Primary Industry.
10. C.S.I.R.O., Agricultural Research Liaison Section.
11. Agricultural Extension in New Zealand. *By* S. H. Saxby.

PAPER 1

AGRICULTURAL ADVISORY SERVICES IN NEW SOUTH WALES*

There are many organizations — government, semi-government, universities, commercial, farm associations, press and radio, etc. — effecting agricultural advisory services in this State.

More than 240 field officers of State Government Departments are engaged full time in agricultural advisory service, while many others have some advisory functions: together the full- and part-time field advisers are equivalent to more than 290 full-time officers — a ratio of about 1 to 250 farming or pastoral properties.

THE NEW SOUTH WALES DEPARTMENT OF AGRICULTURE

Information and advisory services of the New South Wales Department of Agriculture were inaugurated in 1890. They have had a big part in helping to shape the range and quality of rural production and the way of life of the 74,000 rural producers in this State.

The work of the Department may be classified broadly into research, education and advisory, regulatory, and business undertakings.

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* Compiled by New South Wales Department of Agricuture.

Structure of the Department

The Department is organized into Divisions, and a Central Administrative unit that includes Accounts and Records Branches, Experiment Stations Branch, Regional Extension Services Office, Pastures Protection Section, Legal and Registrations Branch, Biometrical Branch, Personnel Section, and Architect's Branch.

1. Division of Science Services comprises the Biology (plant diseases and dairy bacteriological work), Entomology, Chemistry, and Botany Branches; concerned with research, diagnostic, and extension services (through publications, farmer meetings, field days, short schools).

2. Division of Marketing and Agricultural Economics comprises Marketing Bureau and Economics Research Section, and is responsible for research in farm management and farm economics generally, and some extension. Administers the Marketing of Primary Products Act: collates and disseminates market prices information, crop production forecasts, and reports on pastoral conditions; investigates market problems; studies farm economic and business trends; prepares material relative to agricultural policy; and publishes a quarterly journal, *The Review of Marketing and Agricultural Economics.*

3. Division of Plant Industry deals with matters relating to field and vegetable crops, pastures, seeds, and weeds; plant breeding, plant introduction, and agronomy research in general; agronomic advisory services; and administration of the Agricultural Seeds Act.

4. Division of Horticulture deals with fruit industry research and advisory services, and fruit preservation and storage research; administers fruit industry legislation. The Chief of the Division is also Chief Quarantine Officer (Plants) for New South Wales, as an agent of the Commonwealth, and accordingly has also a comprehensive regulatory staff.

5. Division of Animal Industry deals with the diseases and pests of livestock (including research) and breeding, feeding, and management projects; administers livestock legislation and quarantine. The Divisional Chief is Chief Quarantine Officer (Animals) for New South Wales, as an agent of the Commonwealth. Tick quarantine areas are administered in collaboration with the Board of Tick Control. Supplementary animal health services provided by Veterinary Inspectors (employed by Pastures Protection Boards) are also administered.

6. Division of Dairying is concerned with the efficiency of farm production of milk and cream and factors affecting quality; advises and supervises dairy produce factories in all aspects of the manufacture of dairy products, and administers dairy industry legislation; manages the dairy studs and herds at experiment farms and colleges; and, at Hawkesbury Agricultural College, conducts dairy technology research and provides teaching staff for the School of Dairy Technology.

7. Division of Information Services edits most of the Department's extension literature; provides the major part of library services; organizes group extension work; provides extension services for rural women; deals with the audio-visual aids needs of the Department; provides in-service training in extension methods; and maintains an information bureau and publications distribution service to the public.

Field Institutions

The field institutions of the Department include: two Agricultural Colleges — Hawkesbury and Wagga; the Veterinary Research Station, Glenfield; Agricultural Research Institute, Wagga; Agricultural Research Stations at Wollongbar, Tamworth, Trangie, Yanco, Glen Innes, and Lower Murray; the Poultry Research Station, Seven Hills; Citrus Research Station, Narara; Tropical Fruit Research Station, Alstonville; Experiment Farms at Bathurst, Condobolin, Cowra, Grafton, Griffith, Leeton, Temora, and Narrabri; and some sub-stations.

The Chief, Experiment Farms and Stations, in Central Administration, is responsible for maintenance and developmental aspects of the research stations and experiment farms, but not for the technical subject-matter work proceeding there.

Two Agricultural Colleges

Hawkesbury Agricultural College, accommodating some 240 students, provides three Diploma courses at tertiary educational level; and Wagga Agricultural College, accommodating some 90 students, provides one such Diploma course. Hawkesbury provides Diplomas in Agriculture (3 years), Dairy Technology (2 years), and Food Technology (3 years); Wagga provides a Diploma in Agriculture (3 years). Many of the Department's personnel in the field, and some administrative personnel, are diplomates of its own Colleges.

The two Colleges and Yanco Agricultural Research Station are used also for short-term schools for farmers — 'Animal Husbandry', 'Irrigation', 'Pasture and Crop Husbandry', 'Tractor and Machinery Maintenance' Schools, etc. — of from 3 to 5 days' duration.

A District Field Officer System

The Department of Agriculture depends on a district field officer system of advisory service. There are field officers at some 70 country addresses. The basic extension services are provided by officers of the Divisions of Plant Industry, Horticulture, Dairying, and Animal Husbandry. For this purpose each of these Divisions has a system of district officers:

Agronomists, Division of Plant Industry

Fruit Officers, Division of Horticulture

Dairy Officers, Division of Dairying

District Veterinary Officers and Livestock Officers (Sheep and Wool, Beef, Pigs, Poultry, and Apiary categories of officer), Division of Animal Industry.

Veterinary Inspectors employed by the Pastures Protection Boards supplement the Division's personnel.

There are also some district plant pathologists and entomologists of the Division of Science Services. Economics Research Officers of the Division of Marketing & Agricultural Economics appointed to Regions are part of a plan to advance farm management extension services within the framework of the regional extension service.

Headquarters staff of Division of Science Services and Division of Marketing & Agricultural Economics also are in extension (as well as research) through publications, farmer meetings, and short schools. The field officers of the aforementioned Divisions are in effect specialists. But practical circumstances and Departmental policy require them at all times to advise to the limit of their competency in others besides their special field. In effect they have a horizontal plane of competency ('generalism' appropriate to the area they're located in) and a vertical plane (the subject-matter discipline of their parent Division or Branch).

Diplomates of the Agricultural Colleges have traditionally comprised the main body of district officers other than veterinary. But university graduates in agricultural science also enter district officer ranks, though most of them go to research or allied science service.

Services are free. By letters, 'phone calls, farmer visits to offices, and by officers' farm visits, a great volume of 'personal-contact' service occurs. But in a country where distances are great and an officer's subject-matter 'district' may extend over several shires, personal contacts are numerically inadequate. So, the service makes good use of group and mass contact methods; newspapers, other publications, radio, group meetings for lectures, discussions, film evenings, field days, short-term schools, short-term courses, demonstration projects on farms, and kindred activities.

Extension equipment is considerable. Typically, district offices have a portable 16 mm cine film projector, a 35 mm film strip and slide projector, 35 mm cameras, a portable public address system, tape recorder, and accessories such as screens and desk slide-viewers. At Regional headquarters are magnet flannelboards and an episcope.

District agronomists are chairmen of district Coordinated Extension Service panels. Each panel consists of district colleagues, from other Divisions of the Department and from certain other government departments or agencies that effect farm advisory service. Thus, officers of several sections of the Department of Agriculture, and officers of the Department of Conservation (soil conservationists specifically), New South Wales Milk Board Supervisors, and Rural Bank Valuators, have the machinery to coordinate farm advice in the area.

Nearly 80% of the Department of Agriculture's 3,000 professional, general, and clerical employees are in rural areas. Many of the professional officers are not in 'district officer' categories; but, stationed at experiment farms, research stations and institutes, or agricultural colleges, they too perform advisory service — in part to district officers, in part to farmers.

Decentralized Regional Supervision of Extension Services

The field officers of the Department, excluding veterinary personnel and the personnel at research institutions, experiment stations, and the two Agricultural Colleges, are under the immediate control of Regional Supervisors of Agriculture. There are nine Agricultural Regions for this purpose. A relatively few district officers are not in a region; some of these are near Sydney and others in the far west.

For each Region there is a publicity officer. These officers focus on mass and group means of advisory service — the press, radio, field days, conventions, and meetings. Their effect is in part through personal use of those media (but not as subject-matter men) and in part by developing the field officers' interests and skills in them.

The nine Regional Supervisors are responsible to a central administrative officer, the Chief of Regional Extension Services. He is also responsible to the permanent head for effective supervision and recording of Commonwealth Extension Services Grant and Dairy Industry Extension Services Grant funds in extension work in this State.

Veterinary officers, Division of Animal Industry, are not in the Regionally supervised Agricultural Region system that embraces other district officers of all Divisions. They have their own decentralized system, responsible to the Chief, Division of Animal Industry. Each of the 11 Veterinary Districts includes several Pastures Protection Boards (a specialized local-government body). Veterinary inspectors employed by the Pastures Protection Boards in the Veterinary District form a team of associates with the Department's District Veterinary Officer. The veterinary personnel are a marked force in advisory services, notwithstanding their regulatory functions.

Specialists for Research and Extension Planning and Liaison

Each 'production' Division of the Department — Plant Industry, Horticulture, Dairying, and Animal Industry — has a team of subject-matter principals and specialists, also principal officers for research and for extension. They help to plan and direct research, to advise on policy in their respective fields, to guide allocation of research and extension resources, and to keep field officers abreast of advances in the subject-matter specialities.

Extension Effectiveness and Extension Aids

Method specialists in the Division of Information Services assist and supplement the efforts of district extension officers.

The editing staff process material for a monthly journal *The Agricultural Gazette of New South Wales,* a monthly *Poultry Notice,* a bi-monthly *Dairy Topics,* a weekly *Press Copy* sheet (this goes to some 350 newspapers and radio stations), a range of more than 800 booklets, pamphlets (with a dozen or so exceptions, these are free), and special productions for short-term schools or courses.

The display artist section contributes to show exhibits, lecture aids, and publications' art work. Photographic aids section handles field officers' camera products, for return to them as 35 mm slides. They also produce 16 mm cine films, participating in script production for others to be made on contract, and provide a cine film loan service for field officers and farm groups. Radio recordings from the radio section supplement field officers' farm broadcasts.

The library circulates some 500 items per week of periodical literature among Departmental officers, provides a reference search service to science and extension personnel, and fulfils the other normal functions of a technical library.

There are many farm organizations, some as old as the Department. The Department provides (in Division of Information Services) an organizing staff to assist a rural body known as The Agricultural Bureau of New South Wales. The Bureau has been an extension aid since 1910.

A women's extension service is provided. Many enquiries from farm homes are handled by correspondence. Sessions for rural womenfolk are staged at field days and rural conventions. Farm home articles are regular in the weekly *Press Copy*, and a flow of tape recordings supplements field officers' farm broadcasts.

The Department's interest in rural welfare is reflected also in 'Leadership Training Schools' promoted by the Division of Information Services for farm men and women. Talent for active roles in community affairs is developed there.

THE NEW SOUTH WALES DEPARTMENT OF CONSERVATION

The constituent organizations of the Department of Conservation — the Water Conservation and Irrigation Commission, the Forestry Commission, and the Soil Conservation Service — are active in varying degrees in agricultural extension work.

The Water Conservation and Irrigation Commission has some extension activities. The Commission's Farm Water Supplies Section provides sprinkler irrigation and field irrigation designs and layouts in accordance with the provisions of the Farm Water Supplies Act; fees are charged for these services. Officers of the Commission also lecture at specialized irrigation schools for farmers and occasionally at Agricultural Bureau meetings.

Publications from the Irrigation Research Section of the Water Conservation and Irrigation Commission are designed as indirect aids to extension; for example, they are used by extension officers of the Department of Agriculture. The Commission also assists the Department of Agriculture by the provision of tutors for in-service training schools.

The Forestry Commission has a more limited role in agricultural extension. The Commission's District and Sub-district offices and its four amenity nurseries answer some thousands of enquiries each year about tree plantings for windbreaks, shade and shelter trees, fodder, woodlots, and ornamental and amenity plantings. Recently a senior Forestry Officer has been appointed to advise landholders on all aspects of farm forestry. Another important extension function is in bushfire control in close association with the Bush Fire Brigade organization.

The Soil Conservation Service

The Soil Conservation Service of New South Wales, because of its functions, is the most active of the constituent organizations of the Department of Conservation in agricultural extension. The Service was authorized by the Soil Conservation Act of 1938 — the first legislation of its kind in Australia. The first task confronting the Service was to establish a staff of officers skilled in agronomy, soil science, forestry, and surveying who could readily adapt their experience and training to develop appropriate soil conservation techniques; the second was to build an organization to reach the man on the land with advice on, and assistance with, his erosion problem.

Six research stations (the first established in 1941 and the others by 1948) at strategic locations on typical erosion-affected country have been used to develop modifications of overseas conservation techniques, to evolve new techniques, and to demonstrate conservation practices.

A detailed erosion survey, in 1941–43, of the Eastern and Central Divisions of the State, embracing nearly all the arable areas and 90% of the livestock capacity, showed that 48% of the 118 million acres was appreciably affected by soil erosion. Development of the Service was planned from the survey information. Twelve Soil Conservation Districts, with 50 sub-districts, were established in two stages.

The 159 major demonstrations on private farms and 352 minor demonstrations have helped extend knowledge of conservation techniques developed by the Service. The minor demonstrations commit the landholder to complete the scheme of control works at his own expense.

The amendment of the Soil Conservation Act in 1947 authorized the acquisition of heavy earthmoving equipment by the Minister for Conservation and its hire to landholders. The earthmoving work is designed, laid out in the field, and constructed under the supervision of soil conservationists. This has led to the present procedures in the extension work of the Service. The expenditure by landholders on hire of plant has exceeded a total of £1,750,000. The 1947 amendment also established an Advances Scheme, designed to ensure that landholders would not be hindered by lack of finance. Since its inception, 254 advances have been approved for a total amount of £200,000.

Current Structure.—Working under the direction of specialist staff (Extension, Research, Investigation, Engineering, Survey, and Drawing Sections) in the Head Office in Sydney, the twelve District Soil Conservationists have direct control of soil conservationists located in 61 towns spread throughout the State. These officers design and implement the work performed by a fleet of 88 heavy earthmoving tractors and associated equipment. In addition, a considerable part of the time of officers engaged on extension is occupied in work carried out by landholders with their own equipment or with equipment hired from contractors.

The 12 District Soil Conservationists exercise decentralized authority. They are responsible for local field supervision and coordination and for liaison between extension and research. The research stations are overseen by the appropriate

District Soil Conservationists, facilitating ready transmission of problems and solutions between research and extension officers.

The total staff of 441 includes 27 scientific officers, 89 extension officers, and 325 others. The general qualification of extension officers is an agricultural college diploma in agriculture. The 89 extension officers are engaged full time in extension work; the scientific officers are engaged in extension work for less than one-quarter of their total time. Ninety per cent. of all staff are located at country centres.

The Service has, in recent years, paid increasing attention to the necessity for complete farm plans for conservation and has developed farm planning and land classification techniques. The expanding farm planning service recommends farm designs which give maximum efficiency of operation while providing complete protection from erosion. The general approach to soil conservation by improved vegetation, stabilized soil structure, and increased absorption of rainfall is an essential part of the extension officers' approach to farm management, involving particularly land classification, grazing management, and crop rotation.

The Soil Conservation Service uses mass media (radio, press, the Journal of the Soil Conservation Service, leaflets, and show exhibits) and group methods (farm group meetings, field days, and conferences). However, individual advice to landholders is the principal approach. A soil conservation problem is peculiar to the farm concerned and the soil conservationist must draw on an extensive knowledge of all techniques to select those that meet the problem. Only rarely are mass or group methods sufficient to give the landholder a satisfactory course of action.

Junior Farmers' Organization of New South Wales

Junior Farmers' Clubs provide direct personal instruction in almost every phase of rural endeavour including the home. Personal instruction to members is provided by a field staff of 27 full-time supervisors who are officers of the Department of Education. Emphasis is placed on the keeping of correct records. Training is given, also, through intra- and interstate tours, schools of instruction, and seminars. Girls and boys between the ages of 10 and 25 years are assisted also by officers of other Departments and by leaders in many fields. Public speaking, debating, meeting procedure, and leadership training are provided.

Direct liaison and exchanges are effected with other Australian States, New Zealand, America, and Great Britain.

Personal work in the form of a project is compulsory for the 7,500 members in some 300 clubs throughout the State. Participation in community activities is encouraged. Development of social attributes and character are encouraged through inter-club and State competitions and interchange of visits between clubs and members. Correct attitudes to recent developments are stimulated.

An effort is made to promulgate the findings of the research worker, the experimentalist, and the technician.

Printed instructional material is supplied to all members.

Adult advisory committees take a personal interest in local clubs. Generally, public support is regular and effective.

Policy is controlled by a State Council comprising representatives from Government Departments, growers' organizations, professional bodies, and representatives of local district committees.

Clubs are non-sectarian and non-political.

THE RURAL BANK OF NEW SOUTH WALES

The Rural Bank of New South Wales has always taken an active part in agricultural extension as an integral part of its own activities in the field of rural finance. This interest in agricultural extension has been general and has not been confined merely to the customers of the Bank.

The Bank maintains a field staff of 35 trained personnel located at 20 strategic centres throughout the State to advise the Bank, its customers, and others, if desired, on all aspects of rural development and production. In this regard the Bank has been a pioneer amongst banks and the service provides for direct personal contact and discussion with individual landholders on all aspects of property management. In this advisory work full regard is taken of research, advice, and recommendations by Commonwealth and State Departments operating in particular rural fields, e.g. C.S.I.R.O. and State Departments of Agriculture and Conservation, and close contact is maintained between officers of these organizations and the Bank's field staff.

It has been our experience that the most effective administration of rural credit requires the services of a specially trained field staff to provide and maintain the highly desirable direct personal contacts in the field between the Bank and its customers.

In the broader field of the Bank's interest in promoting rural progress and development, the Bank has sponsored competitions for progressive farmers, fat lamb and beef cattle breeders, and junior farmers in association with the Department of Agriculture, the Agriculture Bureau of New South Wales, and the Junior Farmer Movement. In addition, numerous awards and trophies are provided at agricultural shows throughout the State. For these competitions and awards the Bank provided £5,700 during the financial year ended 30th June, 1961. Further, the Bank has assisted rural research in a wide variety of fields by donations and grants totalling £2,700 during 1960–61 for such purposes as irrigation research and extension, poultry husbandry research, food technology research, dairy industry research, flood mitigation research, and fruit fly research.

THE NEW SOUTH WALES MILK BOARD

The New South Wales Milk Board is charged with supervising the production and distribution of milk for Sydney Metropolitan, Newcastle, and Wollongong areas and some smaller areas in New South Wales.

After the war a major aim of the Board was to develop production in the milk zone to ensure adequate supplies of milk, particularly during the autumn-winter months. In 1952 the Milk Zone Production Central Advisory Committee was constituted to assist in this task; a Production Officer was appointed as executive officer of the Committee. District committees were formed to assist in the production drive. The response to the production drive was excellent; the threat of winter rationing was immediately removed. In 1954 the Board reconstituted the Committee as the Milk Zone Dairy Farm Advisory Council coordinating the activities of Dairy Farm District Councils in increasing efficiency in the industry.

The District Councils include the Board's District Field Officer, the factory manager, and representatives of farmer organizations, the Departments of Agriculture and Conservation, and the Rural Bank of New South Wales. They are the main group extension contacts of the 23 Milk Board supervisors working with dairy farmers. They sponsor and arrange field days, lectures, and film screenings, and advise Board officers of problems limiting production efficiency.

Farm visits by Milk Board supervisors are usually primarily regulatory, but the supervisors advise as far as they are competent on farm practices affecting quality or quantity of production. They also draw on other extension agencies when necessary.

PAPER 2

AGRICULTURAL EXTENSION SERVICES IN VICTORIA*

Agricultural extension (advisory) service to farmers in Victoria is supplied principally by the State Department of Agriculture, Soil Conservation Authority, State Rivers & Water Supply Commission, Department of Crown Lands & Survey, and the agricultural press, radio, and television services. Contributions are also made by other State Government agencies, Marketing Boards, primary industry organizations, manufacturing and trading companies, banks, and private agricultural and veterinary services.

The Commonwealth Scientific & Industrial Research Organization, the Commonwealth Department of Primary Industry, and the universities make available the results of their applied research and surveys to State Government Departments, the press, and direct to farmers on request. The Veterinary Research Institute of the University provides a diagnostic service to the Department of Agriculture and private farmers.

To place Victorian agriculture in perspective and to explain the comparative emphasis given by the extension service to its various classes of agricultural production, a summarized picture is given by the statistics for the year 1961.

STATISTICS, 1961

Area of State	56·2 million acres
No. of rural holdings	69,770
Used for stock (pasture)	25·8 million acres (over 50% improved)
Used for agriculture (fallow, crops, orchards, vegetables, etc.)	7·0 million acres

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* Compiled by the Victorian Department of Agriculture, Soil Conservation Authority, State Rivers and Water Supply Commission, and Department of Crown Lands and Survey.

Stock numbers	
Sheep and lambs	26·6 million
Dairy cattle	1·7 million
Beef cattle	1·1 million
Pigs	0·3 million
Gross Rural Production Values (average 5 years to 1960/61)	
Wool	£76,000,000
Meat (Cattle)	44,000,000
Meat (Sheep)	25,000,000
Meat (Pigs)	7,000,000
Meat (Poultry)	7,000,000
Milk (liquid, butter, cheese, etc.)	61,000,000
Cereal grain	38,000,000
Hay	18,000,000
Fruit and vines	20,000,000
Vegetables and potatoes	16,000,000
Eggs	17,000,000
Tobacco	3,000,000
Miscellaneous	4,000,000
Total	£336,000,000

This paper describes briefly the functions and work of the State Government extension services.

DEPARTMENT OF AGRICULTURE

Historical Review

The forerunner of the present Department of Agriculture, viz.: the Board of Agriculture, was formed in 1859, only eight years after the proclamation of the State as an independent self-governing democracy. Ten years later, the passing of the Land Act ended the squatting era and established agricultural settlement in Victoria on a sound basis. The Department, formed in 1872, did much to foster improved agricultural practices and by the end of the century many farmers and farmers' clubs were looking to it for advice and assistance. About this time, the day of the agricultural scientist had dawned, and the Department had on its staff expert officers ranging from wheat, dairy, stock, and horticultural advisers to a vegetable pathologist, an entomologist, and a chemist. They published various advisory Bulletins and Guides for farmers. In 1874 the Stock Act, aimed at animal disease control, was passed and the extension activities of the future Live Stock Division, backed by Regulations, commenced. In 1896 the Vegetation and Vine Diseases Act laid the foundations of district advisory and regulatory work in horticulture, and in 1905 the Milk and Dairy Supervision Act gave similar benefits to the dairying industry.

In 1902, the information service was strengthened by the monthly publication of 'The Journal of Agriculture', which has persisted as the main general extension publication of the Department. Even earlier, the importance of training in Agriculture was evidenced by the passing of the Agricultural Colleges Act in 1884, soon after which Dookie and Longerenong Colleges were established.

It is impracticable here to describe the steady development of the Department of Agriculture to its present establishment of 1,198 officers plus 360 employees, or the manner in which its regulatory, extension (advisory), and research services have been developed and blended. They have grown in response to the requirements of the community, influenced by available and potential markets and affected as it has been by wars, droughts, depressions, and booms.

The Better Farming Train in the 1924–35 period and the Mobile Extension Unit in 1954–58 marked special extension efforts by the Department, as did the pasture improvement campaign commenced in 1931 subsidized by the Pasture Improvement League. The success of these ventures indicated a realization by farmers of the need for advanced techniques and resulted in an insistent demand for more research, research stations, and advisory officers. This demand still continues.

Expenditure by the Department of Agriculture is derived mainly from State Government sources reinforced, in recent years, by grants for both research and extension work from most agricultural industries and the Commonwealth Government. It is interesting to note that the total number of officers has grown from 528 officers in 1932, and 676 officers in 1948, up to the present figure of 1,198.

Structure of the Department of Agriculture

Under the Minister of Agriculture the Department is controlled by the Director of Agriculture assisted in the Central Administration by the Deputy Director, Senior Executive Officer, Secretary, Accountant, Commercial Officer, and their staffs. There are five main Divisions and three principal Branches, as shown in the statistics of the personnel employed by the Department as at May 1962 (Table 1).

TABLE 1

TOTAL PERSONNEL — MAY 1962

Division or Branch	Professional	Technical	Administrative (Clerical)	Temporary	Total
Central Administration	10	13	41	14	78
Agriculture	88	83	11	49	231
Horticulture	32	117	11	96	256
Live Stock	54	55	15	39	163
Dairying	18	121	15	45	199
Agricultural Education	27	75	11	21	134
Chemical Laboratories	25	7	2	17	51
Biology	29	11	1	20	61
Information	5	9	2	9	25
	288	491	109	310	1,198

Note. In addition, approximately 360 employees are engaged on research farms, colleges, cool stores, etc. Staff of Marketing Boards are not included.

Nearly all the professional staff are university graduates (87%) as are some of the administrative officers. The technical staff are mainly agricultural college diplomates (36%) or have passed special qualifying examinations.

The Department conducts 15 Agricultural Research Stations and 3 Colleges.

Extension Staff

Each Division and Branch is responsible in varying degrees for extension in addition to its research, experimental, regulatory, or youth teaching activities. The extension work of each is contributed to by both full- and part-time staff, the numbers of which are summarized in Table 2. They exclude the percentage of time spent by part-time officers on regulatory work, e.g. produce, stock, dairy, and fruit inspection. It will be noted that there is no Division of Extension, but the Information Branch serves all Divisions.

Opportunities for staff promotion and advancement for similarly qualified research and extension officers are equal in the Department of Agriculture.

TABLE 2

EXTENSION STAFF

Division or Branch	Total	Full-time	Part-time				Total equivalent full-time	Stationed in country
			75%	50%	25%	Full-time equivalent		
Agriculture	59	10	7	18	24	20	30	44
Horticulture	84	19	26	2	37	29	48	68
Live Stock	67	24	—	13	30	14	38	40
Dairying	97	6	7	2	82	27	33	90
Information	15	5	—	—	—	—	15	—
Biology	6	2	—	4	—	2	4	—
Agricultural Education* (Colleges)	1	1	—	—	—	1	2	2
Agricultural Economics	5	—	—	4	1	2	2	5
Totals	334	77	40	43	174	95	172	249
				257				

Note. Purely administrative, library, and clerical officers not included.

* Many officers contribute to short courses, radio, T.V., etc.

The above table shows that 334 officers (professional and technical) are engaged in extension work — 77 full-time and 257 part-time, equivalent to 172 full-time officers. It is considered that this system of combined full- and part-time extension activity provides greater efficiency than would be obtained if extension work were confined to full-time extension officers.

The main extension functions of the staff listed above, according to Divisions and Branches, are as follows:

Agricultural Division.—Of the 59 officers engaged in extension work, all but 10 take part in experimental work, including result demonstrations. The functions include advice on general farm maintenance and development given by District Agricultural Officers, pasture improvement, irrigation, crop production (wheat, oats, barley, potatoes, tobacco, linseed), fodder conservation, etc.

Horticultural Division (established 1923).—Of 84 officers, 19 give extension their full time, being horticultural and vegetable instructors and supervisors. Sixty-five have other duties, either regulatory or experimental. The main subjects include orchard establishment, tree and plant nutrition, irrigation and soil management, disease and pest control, fruit packing, storage, and marketing, etc. Fruit fly inspectors and others solely engaged on inspection work are not included.

Live Stock Division (established 1905).—Of the 67 officers engaged in extension, 24 are full-time serving mainly the sheep, cattle, poultry, pig, and honey industries. The Veterinary Officers and the district Stock Inspectors (28) administer various Acts concerned with the control of stock diseases and concurrently give much advice.

Dairying Division (established 1934).—Of the 97 officers engaged in extension, 80 are dairy supervisors, who administer the Regulations of the Milk and Dairy Supervision Act and who, on the average, give 25% of their time in production extension activities. The technical officers concerned in herd testing are also part-time extension workers. Six full-time Dairy Husbandry graduate officers are industry extension specialists. The Division conducts the School of Dairy Technology where dairy factory operatives are trained.

Information Branch.—Fifteen scientific or technical officers are engaged full-time extending information supplied by all Divisions by means of publications, circulars, motion picture and still films, radio, television, etc., including film production. The Department has its own motion picture production unit.

Biology Branch.—Mainly a research branch, it has six officers concerned with advisory work (plant pathologists and entomologists). Full extension liaison is maintained with the Divisions.

Agricultural Education Division.—In addition to training some 280 students annually at Dookie and Longerenong Agricultural Colleges and at the Burnley Horticultural College, short courses (2–3 weeks) are provided for about 350 farmers per annum at Dookie. The Glenormiston Estate is also maintained, at present for research purposes.

Chemical Laboratories.—The laboratories conduct analyses for all Divisions, and soil surveys, etc. They also analyse and register fertilizers, stock foods, pesticides, fungicides, etc. They are not regarded as an extension Branch.

Agricultural Economics Branch.—Officers conduct farm management surveys and investigations and assist district officers in farm management economics.

Current Trends and Developments

The current trend in the development of the extension services of the Department is to strengthen its present structure with the following immediate objectives:

1. To increase and establish the number of graduate District Agricultural Officers (D.A.O.s) and extension officers in charge of districts to at least 24, compared with only 10 at present. They are 'general practitioners' who serve mixed farming districts and are supported by industry specialists as needed.
   The D.A.O. Branch was established in 1948 with a small group of 7 experienced university graduates withdrawn from research responsibilities in the Agricultural Division. The additional men have resulted from a university scholarship scheme under the Commonwealth Extension Services (Agric.) Grant, and this policy is being continued.
   The required numbers are almost achieved as a result of the scholarships and in-service training schemes, but recruitment will continue.
2. To fill the serious number of vacancies (9) for District Veterinary Officers. Thirty students are now doing the Veterinary course on Departmental scholarships and will work in Victoria on graduation.
3. To increase the number of industry specialists, e.g. dairy husbandry and sheep and wool advisers, agronomists, horticultural extension specialists, etc.
4. To provide more technical assistance for professional officers, particularly to assist in the conduct of result demonstrations.
5. To expand the Farm Economics Branch as a support for the increasing emphasis on the need for farm management extension advice by specialist and district officers.
6. To accelerate in-service training facilities.
7. To make maximum use of television as the latest method of mass media extension.
8. To conduct research to determine the most efficient methods of extension for the different classes of objectives in the various population environments.

Decentralization

Decentralization of extension staff is most desirable, not only in order that better extension service may be given, but also to enable the Department to be better informed regarding the actual extension needs of farmers. Some 249 extension officers, or approximately 75% of the total number engaged in extension, are located in 67 country towns or on one of the 15 Departmental research farms or centres. Most extension officers who are stationed in Melbourne travel extensively in the country.

Without a full knowledge of the types of agriculture concerned, size of farms, density of population, etc., it is dangerous to compare extension services attached to various forms of primary industry and of different States or countries by dividing the number of personnel involved into the farm population, number of rural holdings, or areas. However, for any value that the resulting figure may have, Victoria has approximately 70,000 rural holdings served by a total of full-time extension personnel equivalent to approximately 172 officers, i.e. 1 per 400 holdings. However, this does not indicate by any means that even one-quarter of the farms are actually visited once a year by an extension officer, e.g. it is doubtful whether extension officers would visit in a year more than 5% of the cereal-growers. On the other hand, most tobacco-growers would be visited at least annually and farm visiting is more frequent in the intensive industries, e.g. horticultural and irrigated settlements. Nevertheless, practically all farmers benefit from the extension service.

Field Supervision

Country-based officers are located in groups of from 2 to 12 in number while there are 32 officers working as single units. Supervision, except for accommodation requirements, is on a Divisional basis, the senior officer in the region taking considerable responsibility, e.g. the 72 Dairy Supervisors are administered in the country by 8 seniors. Officers at a centre cooperate and exchange relevant information. In the most distant corner of the State, including the north-west irrigated Mallee settlement of Sunraysia, the various activities of the Horticultural Division are coordinated by a Senior District Horticultural Officer controlling nine advisory officers as well as research officers.

Coordination of Extension Activities

In the absence of a special division of extension, coordination is supplied, where necessary, through Central Administration on a Departmental basis, and in Divisions by their Superintendents, who delegate as required, e.g. to the Senior District Agricultural Officer, Senior Horticultural Instructor, Senior Sheep and Wool Officer, etc.

The publications and press statements of the Department pass through the hands of the Information Officer following Divisional preparation and approval, although authorized district officers supply local papers and radio stations with information direct.

Consultation but not coordination takes place between Departments as may be required. In many country towns, officers of two or more State Government Departments occupy the same offices, ensuring close cooperation. Numerous Departmental committees facilitate discussion and the establishment of Departmental policy on numerous subjects. Departmental officers serve on various Commonwealth–State committees under the auspices of the Australian Agricultural Council.

Research–Extension Liaison

In a Department organized for research and extension on a Divisional basis little difficulty arises in research–extension liaison, as the work of the various Branches is closely integrated on a subject-matter basis. Industry specialists are expected to keep in close liaison with district officers, and locally based officers of different Divisions are in constant touch.

The Department's Library with four officers organizes the distribution of a large range of Australian and overseas publications, the greatest problem being for officers to make time to read them.

Difficulties do occur in communicating progress reports on research projects before publication and in some cases extension officers should see more of field experimental work as it takes place in their districts. However, applicable results are published, soon after being obtained, in Departmental technical bulletins or as papers in various scientific journals, and summaries are included in the Journal of Agriculture or one of the various industry digests. Newsletters compiled by specialists and research workers on various subjects are circulated and could be more widely used.

Regular conferences are held, usually on a subject-matter or Branch basis, e.g. fodder conservation, wheat quality improvement, irrigated pastures, television programmes, etc. Veterinary Officers confer quarterly and seminars and refresher courses are held. Nevertheless, there is undoubtedly a need for improved liaison, attainable even with existing staff members.

The new *Journal of Experimental Agriculture and Animal Husbandry* is a most useful publication and should encourage the earlier availability of experimental data.

Farm Management Extension

Any experienced extension worker involuntarily envisages the general effect of a recommended farm practice on the general management of the farm and, in fact, considers it before making a recommendation. To date the Department has not engaged in much detailed whole-farm management planning or budgeting, partly because so far there has been little demand for it, but also because of lack of trained staff and production standards for them to work by. The Farm Economics Branch is being built up to reduce this deficiency and to assist district officers. It may be expected that the need and demand for more farm management extension advice will increase as, through demonstration, its value is recognized. At the same time, the thirst for technical advice appears to be unquenchable.

Mass Media Extension

All the accepted mass media are utilized to varying degrees according to their application to the different needs and as staff and facilities are available. Victorian trends are discussed in other papers submitted to the Extension Conference.

The media may be listed as:

The Victorian Journal of Agriculture (11,500 subscribers); special industry publications (for which a small charge is made);

Weekly, monthly, and special press statements; industry digests (60,000 distributed free annually);

Circulars, still pictures, and slides; motion picture films (89 films produced since 1940);

Radio (A.B.C. and commercial stations);

Television, in which a definite start has been made both in live production and the regular supply of film clips to both the A.B.C. and country commercial stations; still films, slides, and art work; this service is supplemented with motion picture films.

Country-based officers contribute to local papers and also to local radio and television programmes. Regular radio programmes entitled 'The Voice of Agriculture' have been supplied weekly since 1954 to 14 country commercial stations, who make a small charge for the service. Officers also speak over the A.B.C.'s local, State, national, and overseas programmes.

For country shows and at the Melbourne Royal Show exhibits are prepared mainly to stimulate interest.

Group Methods

In the field, group methods in the form of field days, farm walks, competitions, discussion groups, etc. are commonly and increasingly used, there being a trend away from lectures and film evenings. Some farmers' schools are conducted and these will increase as staff become more available and experienced. Apart from the above, district officers work mainly on a 'request basis' other than farm visits required under Regulations or for surveys. However, requests may be stimulated in various ways by an enterprising and energetic officer. There is an increasing demand for on-the-farm advice which cannot be met.

Demonstration in the field of improved practices is probably the most telling form of extension and the motto 'seeing is believing' is still the hard core of extension work and applies at all levels of the extension ladder. Farmer participation in the formulation of extension programmes, including result demonstrations, is most desirable and is therefore encouraged.

There is no agricultural bureau in Victoria in contrast to those conducted in New South Wales and South Australia. The Chamber of Agriculture and its affiliated Agricultural Societies which are to be found in all the main country towns do not completely meet the need for regular district meetings of farmers to discuss production problems. On the other hand, individual industry associations and the Australian Primary Producers' Union are strongly established in Victoria, e.g. dairy farmers and herd test associations, wheat and wool growers, graziers, tobacco, poultry farmers, and several associations of fruitgrowers. Extension officers work freely with branches of these bodies although much more could be achieved through them.

The industry periodicals are a very effective channel for written extension material, which is appreciated by both editors and readers.

Young Farmers' Movement

The Young Farmers' Movement is well established in Victoria. The Junior Section is controlled by the Education Department being located at its schools, having developed from school clubs, e.g. calf clubs, some 40 years ago.

The Senior Young Farmers' Movement comprises approximately 130 clubs with 3,500 members, the secretarial and organizational work being conducted through the Royal Agricultural Society with substantial support from a Government grant. The Superintendent of Agricultural Education is Chairman of the Senior Young Farmers' Council, which coordinates all activities. The Senior Dairy Husbandry Officer is also a member. Country officers cooperate with local Clubs but more could and will be done in this field.

Libraries

The Department of Agriculture's Central Library in Melbourne supplies country officers with a wealth of agricultural literature and regular accession lists of new books and pamphlets which can be borrowed on request. This service is extensively used. Lists of references on particular subjects are compiled. Country offices and Research Stations have their own small libraries.

Women's Services

The Department does not conduct an organized 'home economics service' although advice is given on such matters as fruit preserving, etc. by three female officers.

In-service Training for Extension Workers

This important requirement is met mainly by the association of young officers with their more experienced seniors in the various Divisions and Branches, and in the conduct of field projects and surveys. Regular schools are held on a Departmental basis, particularly concerning the use of various extension methods, and Divisional conferences are conducted on a subject-matter basis. All officers are expected to read extensively and are supplied with literature concerning extension methods.

Whenever possible, officers at all levels are given an opportunity to obtain interstate experience at conferences or on inspection tours.

THE SOIL CONSERVATION AUTHORITY OF VICTORIA

Structure

In considering the structure and development of the Victorian Soil Conservation Authority there are certain aspects which first merit explanation.

The Authority was constituted in 1950 with a clear-cut charter, viz., to prevent and mitigate soil erosion, to promote soil conservation, and to determine matters relevant to the utilization of all lands towards the attainment of those objects. The Chairman, Deputy Chairman, and Member are appointed by the Governor-in-Council. Under the Soil Conservation and Land Utilization Act (No. 6372) one of these must be a person with practical farming experience and with a knowledge of soil conservation.

Responsibilities of the Authority members are on a subject and not a Divisional basis, with the result that operations are not compartmented, and communication at top level is constant. Coordination of extension activities within the Authority therefore does not demand a special effort.

Staff allocation is into five Divisions, viz., Administration, Field (Extension Services), Research, Engineering, and Publications and Information. Experience has proved it to be an eminently satisfactory grouping of skills. The Field Division is the largest and the remainder devote most of their efforts in support and development of the extension services.

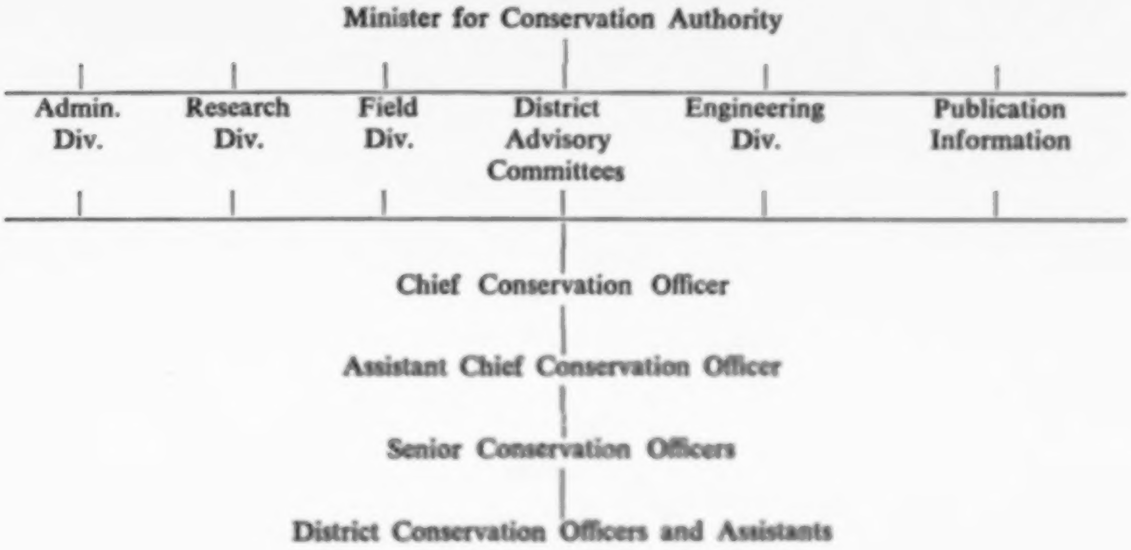
In-service training is aimed at qualifying the extension officer as a 'general practitioner' in soil conservation with the Research and Engineering Divisions as the 'specialists'.

The State has been divided into 26 soil conservation districts by the Authority and in each of these there are, or will be, qualified District Conservation Officers and assistants. Districts are grouped into fours and supervision of these is provided by Senior Conservation Officers who, in turn, are responsible to the Chief Conservation Officer. Also, in each district there are or will be District Advisory Committees appointed under the Act, which provides that the majority of members must be landholders. A typical committee consists of four landholders and three Government Department representatives, one of whom is the District Conservation Officer.

The Authority may refer to committees, or have referred to it by them, matters pertaining to land-use, but in practice the principal function is one of liaison where necessary between landholders and the extension officers.

The structure is clearly shown in the chart (Table 3).

TABLE 3


Minister for Conservation Authority
Admin. Div.
Research Div.
Field Div.
District Advisory Committees
Engineering Div.
Publication Information
Chief Conservation Officer
Assistant Chief Conservation Officer
Senior Conservation Officers
District Conservation Officers and Assistants

Development

The order in which soil conservation districts have been staffed has been governed by the relative degree of urgency for erosion control and soil conservation. As officers become available and qualified, they are posted to the less hazardous districts.

Because of the need to educate farmers in soil conservation, and staff number limitation, the early work dealt mostly with single problems on individual farms. The success of these efforts resulted in ever increasing requests for the Authority's services and the next logical step was to educate the farmer to the idea of complete-farm planning. This now has been developed further in many places to group action by neighbouring landholders. It will be seen, therefore, that the Authority's aim is to effect soil conservation over large areas in planned schemes to make the most efficient use of its extension officers.

Excluding a few casual employees, total staff numbers 100. Full-time extension staff numbers 50; seven are graduates in agricultural science and the remainder are diplomates of recognized agricultural colleges. All are required to undergo in-service training which includes a study of various sciences pertaining to soil conservation and pass prescribed examinations. There are six officers with part-time extension functions ranging from quarter to three-quarter time.

For the season 1958/59 the number of occupiers of rural holdings of over 200 acres was 35,176, the total area occupied was 35,245,195 acres, and total rural population (1954) was 116,500. On these figures there is one extension officer to 704 holdings, 704,502 acres, and 2,330 rural population.

Extension staff is almost wholly decentralized. Both offices and housing have been obtained in most districts and it is Authority policy to minimize postings of officers. Direct supervision of District Conservation Officers and staffs is by Senior Conservation Officers, who are also provided with residences in their respective zones. The Chief Conservation Officer and the Assistant Chief Conservation Officer are stationed at Headquarters. Satisfactory control is effected by means of weekly examination of diaries of extension workers and quarterly reports.

By virtue of the structure, coordination of extension activities within the Authority presents no problem. Authority approval is formally sought for all projects when all relevant information is supplied. Should it be necessary to coordinate services of other Divisions, Authority approval for a project ensures that these services are at the disposal of the extension service. When the cooperation of another Department is necessary an approach is made by the Authority.

Those matters which require Research–Extension liaison and decisions regarding subject-matter integration are referred to the Authority and its approval obtained. Information regarding research work is conveyed to the extension worker in three ways: (1) in the form of instructions; (2) by teaching at the annual Staff School; (3) by printed or mimeographed material provided by the Publications and Information Section.

At farmer level, publications, field days, and individual personal discussion are used. Individual farm planning for soil conservation is subject to Authority approval following recommendations from the District Conservation Officer, which are submitted through senior officers.

Mass media are used constantly to further extension work, and this work is handled by the Information Section.

Field days are the most important aspect of the Authority's group methods in extension and attendances of 500 are common. In addition, film tours, talks to groups, and minor field days are employed. Visits to soil conservation farms and projects are made by many thousands of students.

Individual advisory work is the full-time function of 95% of the extension workers.

A library is provided at headquarters and is used extensively by extension workers, particularly those who are studying to pass internal examinations.

In-service training commences from the outset with practical experience in the field, and spare-time study by the extension officer. The Authority holds a staff school annually of two weeks' duration and attendance is compulsory.

Preliminary and final examinations are held, and these must be passed before an officer can become a District Conservation Officer.

The Publications and Information Section of the Authority distributes copies of appropriate publications and supplies information generally. It is responsible for such matters in connection with extension work as arranging and conducting field days, editing soil conservation competition reports, information brochures, film tours, and press releases of District Advisory Committee meetings. It generally works closely with the Field Division.

Summary

The structure of the Authority is ideal for the efficient functioning of its extension services.

The development, although slow in the earlier years, has been on sound lines, which have stood the test of time and have proved adaptable to all circumstances so far encountered. The acceptance by landholders of the approach to extension has been so satisfactory as to prove embarrassing in relation to numbers of staff and the amount of work which must be done. Landholder acceptance has been reflected in another satisfactory way. Appointments to District Advisory Committees are sought after to the extent that elections are frequently necessary.

The services of the extension worker are being sought by Shire Councils and other Government Departments on a growing scale to advise and instruct.

ADVISORY ACTIVITIES OF THE STATE RIVERS AND WATER SUPPLY COMMISSION

The State Rivers and Water Supply Commission is empowered with a number of responsibilities related to advisory work amongst irrigators. These responsibilities, which are listed under Section 33 of the Water Act include:

> '. . . Instructing the occupiers of lands in irrigation and water supply districts in the best methods of irrigated culture . . . In the utilization of water . . . In general rural economy . . . Conducting irrigated farm competitions . . . Promoting the discussion of matters of general interest by public conferences . . . Advising and instructing occupiers of farm lands with regard to water supply, irrigation, and drainage . . .'

Staff

Several sections of the Commission are responsible for these advisory activities. They include the Irrigation Section, which has two graduates engaged wholly on advisory work together with eleven research graduates who spend about 10% of their time on advisory activities.

In addition, one officer in the Farm Water Supplies Section advises farmers on farm dams construction, pumps, and spray irrigation, and one officer of the Publications Section is engaged full-time on various publicity activities amongst irrigators.

The Commission's Survey and Designs Branches have staff available in country centres to survey farm properties and prepare irrigation layout plans. The work is undertaken when requested by the farmer and a nominal charge is made.

Service Given

The Commission has undertaken advisory work on a range of irrigation and drainage problems. Specialist advice is available from research officers on subjects which include water quality, hydrology, drainage, reclamation, water use, methods of irrigation, sealing and constructing channels, weed control, and channel bank erosion.

The service is best developed at Red Cliffs, where a full-time Advisory Officer is stationed. In this district a complete drainage and irrigation service is available including surveys and plans of layouts and individual advice on special problems. This service is backed up by films, talks, field days, irrigators' schools, and agricultural shows. All these activities are being closely coordinated with the work of the Department of Agriculture and of C.S.I.R.O.

In the Red Cliffs district and in some other Commission districts a local extension publication called *'Water Talk'* is distributed about four times a year. This publication covers matters of local interest to irrigators with emphasis on irrigation and drainage practice. To ensure that the future generation is made aware of the need for careful use of water resources, information is being prepared and distributed to teachers, and a basic course of lessons for use in Victorian schools is in course of preparation.

As the above account shows, the Commission is covering as far as practicable the specific responsibilities with which it is empowered. Moreover, considerable expansion of the advisory activities is planned for the future as they provide an important medium for contributing towards the wise use of water resources.

VERMIN AND NOXIOUS WEEDS EXTENSION IN VICTORIA

The Vermin and Noxious Weeds Board of the Department of Lands and Survey is a regulatory body which administers legislation to control vermin and noxious weeds within Victoria through a staff of 160 field inspectors. Extension of knowledge in these aspects of agriculture is extremely important to keep both the field staff and landholders informed of latest developments, but has special difficulties by being associated with an organization principally concerned with regulatory work.

The history of extension in the Department is brief. Amendment of the Vermin and Noxious Weeds Act in 1949 provided for the establishment for the first time of a research section within the Department. The advent of myxomatosis for rabbit control and selective herbicides for weed control meant that there was a pressing need for extension of the new knowledge throughout the State. Extension work became the responsibility of research officers, with the inevitable result that their research projects were correspondingly reduced. This problem was soon realized by the Department and in 1955 three officers from the inspectorial staff were appointed to carry out extension work under the direction of the senior research officer. These officers had a background of field work on vermin and noxious weed control and had passed an internal examination for appointment as Inspectors. In addition one held a Dookie Diploma of Agriculture. This staff was increased to four officers by the appointment of another inspector as an extension officer in 1957.

Within the group there has been a certain amount of specialization. Two officers have devoted full time to noxious weeds extension work and another has covered vermin extension, particularly the aerial baiting of rabbits. The fourth officer undertakes certain other duties, and would now be classed as employed half-time on extension work. All extension officers are stationed in Melbourne.

In addition to the above staff, the five graduate research officers of the Branch are involved in extension work. Two of these officers, one in weeds research and the other in vermin research, each devote about quarter of their time to extension activities. Consequently the staffing position at present is three full-time extension officers, one half-time extension officer, and two research officers each quarter-time on extension work.

With such a small staff and such a field to cover, priorities have been set on the type of extension carried out. Early emphasis was on lectures and film nights at country centres, but the present feeling is that well organized field days to demonstrate vermin and noxious weed control methods are more profitable. These are organized on a regional basis, but it will take many years to cover the whole State at the present rate. Another important extension activity is the attendance at country shows with two mobile caravan-type exhibits. Other extension activities include the preparation of pamphlets, radio talks, answering correspondence, establishing demonstration plots, etc.

Of note is the extension work on aerial baiting of rabbits in Victoria. The Department pioneered the research on this method of control in Australia, and has made one extension officer responsible for coordinating and encouraging landholders in adopting its use.

Special training is not available for extension officers within the Department, but encouragement is given for them to attend training courses organized by the Public Service Board.

It is realized that there is a big need to appoint a senior officer suitably qualified to take charge of the Department's extension services, and to expand the present staff so that extension avenues at present only briefly covered, such as TV, refresher schools for field staff, publications, press, and radio, can be more fully exploited.

PAPER 3

AGRICULTURAL EXTENSION SERVICES IN QUEENSLAND*

Agricultural extension services in Queensland are provided in the main by the Department of Agriculture and Stock and the Bureau of Sugar Experiment Stations. The Irrigation and Water Supply Commission has a small advisory section, and a few field officers and technical advisers attached to industry organizations and firms also give advice to primary producers.

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* Compiled by the Queensland Department of Agriculture and Stock.

HISTORICAL DEVELOPMENT

The Department of Agriculture and Stock had its genesis in separate Agriculture and Stock Branches in other Departments, but has operated as a Department since 1897. Its primary functions have been (1) to provide research, advisory, and soil conservation services to the primary industries and appropriate services to handlers and processors of primary products, and (2) to administer legislation designed to assist the primary industries in pest and disease control, marketing, standards of farm requirements, etc., and to protect consumers of farm produce such as meat, milk, fruit, and vegetables from unwholesome produce and unfair practices.

The Bureau of Sugar Experiment Stations was formed on the initiative of cane growers in 1900 and was part of the Department of Agriculture and Stock until 1951, when its financing and direction were transferred largely to the sugar industry by Act of Parliament, as the industry desired the Bureau to be free from public service staff conditions, particularly the salary scales.

The Department of Agriculture and Stock has gone through some structural changes in the 65 years of its existence. The traditional structure up till the mid-thirties was a number of independent branches which had been developed to serve various purposes. The haphazard arrangement of branch reports in the Annual Reports of the Department in the early 1930s illustrates the looseness of the organization at that time. In one Report the order was: Agriculture, Pig Raising, Poultry, Cotton Culture, Fruit Culture, Dairying, Entomology and Plant Pathology, Botany, Agricultural Chemistry, Seeds Acts, etc., Stock and Meat Inspection, Sheep and Wool, Animal Health Station, Marketing.

In 1937 a plan of reorganization and coordination of scientific and technical services was drawn up by the late Professor E. J. Goddard, acting as Science Coordination Officer, but only one part of this — the formation of a Division of Plant Industry (Research) — was put into operation before the outbreak of war in 1939 prevented further implementation. During the war years some new thinking was going on in the Department, and this resulted in the appointment by the Public Service Commissioner of a committee of inspection to advise on the reorganization of the Department to suit expected post-war conditions. A scheme recommended by the committee was brought into operation in 1945. It provided for the formation of five Divisions — Animal Industry, Dairying, Marketing, Plant Industry, and Administration. The existing sections concerned with animal health, stock breeding and management, and livestock products other than dairy products were organized into five branches within the Division of Animal Industry. Sections concerned with various aspects of crop and pasture production came under the Division of Plant Industry, while the Division of Dairying was made responsible for dairy hygiene, grading, herd recording, and matters relating to transport and manufacture of dairy products. Marketing services and agricultural materials standards control were put in the Division of Marketing.

The organization effected in 1945 has been kept under review and has been amended in detail as considered necessary by the creation of new branches, reallocation of responsibilities, and so on. The 1962 structure is shown in Table 1.

TABLE 1

DIRECTOR-GENERAL*

DEPUTY DIRECTOR-GENERAL

ADMINISTRATION DIVISION
Administrative unit, Accounts, Records, etc.
Information Branch
Biometrics Section
Research Stations Section
Central Sugar Cane Prices Board

DIVISION OF ANIMAL INDUSTRY
Veterinary Services Branch
Sheep and Wool Branch
Cattle Husbandry Branch
Pig and Poultry Branch
Pathology Branch
Biochemical Branch
Husbandry Research Branch

DIVISION OF DAIRYING
Field Services Branch
Research Branch

DIVISION OF MARKETING
Marketing Branch
Economics Research Branch
Standards Branch

DIVISION OF PLANT INDUSTRY
Agriculture Branch
Horticulture Branch
Soil Conservation Branch
Agricultural Chemical Laboratory Branch
Food Preservation Research Branch
Entomology Section
Botany Section
Plant Pathology Section

* *ex officio* Deputy Chairman, Sugar Experiment Stations Board

EXTENSION TRENDS

The emergence of extension from the rather static phase that was passed through when attention was being concentrated mainly on building up scientific services commenced in 1953, when a general reappraisement of extension services within the Department of Agriculture and Stock was begun. By means of Departmental training schools and action within Branches, a big improvement in the tone and the efficiency of extension services has been effected within recent years.

The most noticeable current trend is towards improving the status of extension officers relative to scientific grades. Recruitment for extension work has always been almost solely from agricultural college diplomates and people with practical experience on properties or in dairy factories. University graduates have usually been appointed to scientific positions, which have at least kept pace with the availability of graduates.

The status of extension workers is being raised in several ways. One is the insistence on a higher average educational standard (though still below that of university degree) for recruits for purely extension work or inspectional work leading to extension work. A second is the adoption of a system of qualifying examinations for promotion of extension officers. A third is the provision of training courses in extension and the allotment by Branches of specially qualified officers to assist their field extension workers in making the most of their capabilities. Finally, the opportunity has been provided for scientific officers with fairly extensive extension responsibilities to reach salary grades previously reserved for straight-out scientific workers. The commencement of a post-graduate diploma course in agricultural extension at the University of Queensland in 1963 will open the way to more graduates desirous of entering the extension rather than the scientific field.

Extension Staff

The full-time-equivalent extension strength of the Department of Agriculture and Stock is 330 and that of the Bureau of Sugar Experiment Stations 18. A dissection of the time spent on extension by officers with full- or part-time extension responsibilities is shown in Table 2. The following are the ratios of full-time-equivalent extension officers to rural population, etc.:

To permanent resident farm population	1 to 550
To rural holdings	1 to 124
To 1,000 acres	1 to 1,075

TABLE 2

	Full-time	¾-time	½-time	¼-time
Department of Agriculture and Stock—				
Division of Animal Industry	51	18	125	27
Division of Dairying	60	4	4	9
Division of Marketing			2	
Division of Plant Industry	89	4	42	52
	200	26	173	88
Bureau of Sugar Experiment Stations ..	16			8
Total	216	26	173	96

With regard to qualifications of extension staff, it may be said that broadly the practising extension officer up to the grade of senior adviser is, in both the Department of Agriculture and Stock and the Bureau of Sugar Experiment Stations, of agricultural college diplomate or equivalent grade. Many Departmental officers holding positions as 'advisers' entered the service as inspectors and moved up, usually in their original Branches, to advisory positions. The next stage in the hierarchy, exercising district supervision over the senior adviser grade, is usually that of district scientific officer concerned partly with investigational work. Officers of this grade are, as specialists, available for consultation with field officers.

Decentralization

Departmental policy has always been to distribute its extension services according to the most urgent demand. At a time when agriculture was extending into new areas, for instance, a high proportion of the extension staff was put into these areas and staffs in established areas were not greatly expanded.

Officers with full- or part-time extension functions are stationed in some 100 different centres, 15 of these being in semi-arid pastoral country and the remainder in crop–dairying or better-class pastoral country.

The field pattern is one of decentralizaton by specialty and not one of integration. That is to say, officers of any one Branch are under the full control of their Branch Director for both administrative and technical purposes — no common supervision embracing more than one Branch is exercised over Departmental officers in a district or region. Further, areas covered by officers of different Branches stationed at the same centre do not necessarily coincide. The disadvantages inherent in this system are overcome to a large extent by providing housekeeping and other common services in a common building where possible and by voluntary cooperation among officers at a centre. The disadvantage of dual supervision under a system whereby the field officer reports to his Branch at Head Office on technical matters and to a local officer supervisor on administrative matters is avoided.

The extension staff of the Sugar Bureau is stationed in the main cane-growing districts.

Field Supervision

Supervision of field staff of the Department of Agriculture and Stock is in the main the responsibility of each Branch concerned. The standard system may be illustrated by reference to the Horticulture Branch. The State is divided into horticultural districts and a Senior Adviser in Horticulture is appointed to each district. He exercises general supervision over Advisers in Horticulture and Inspectors stationed in the district, at the same time performing advisory duties and participating in field trials. In most districts he is himself subject to supervision by a Branch senior scientific officer with both research and supervisory functions. This senior supervising officer is responsible directly to his Branch head at Head Office in Brisbane.

The general pattern therefore is Branch adviser (non-graduate) or inspector (non-graduate) → Branch senior adviser (non-graduate) → Branch district or divisional supervisor (graduate scientific officer) → Branch head (usually graduate) → Divisional head → Director-General. The main variation from this pattern is where there is no Branch senior scientific officer in a district.

Coordination of Extension Activities

The grouping of branches with common interests into Divisions provided the opportunity for coordination of activities within each Division and between Divisions. No means for ensuring coordination has been written into a code of operations, but various intra- and inter-divisional committees which have come into being facilitate exchange of views and agreement upon coordinated action.

Research–Extension Liaison and Subject-matter Integration

Research–extension liaison is achieved in the extension–research direction largely through (1) contacts between extension and research officers and Branch administrative officers, and (2) regional and State subject-matter conferences. It is expected that, in future, Station Committees for Departmental research stations will provide a very close liaison on a district basis. The Station Committees, consisting of selected district officers, are responsible for planning investigations on stations under the control of a Research Stations Board. It is specifically stated in the Board's Code of Operations that 'Extension staff are included in Station Committees for the purpose of assisting in the preparation of research programmes designed to meet State and district primary industry needs, and they are expected to play an important part in Station Committee decisions on research objectives'.

In the reverse direction — research to extension — liaison is effected largely on a Branch basis through personal contact, information circulars and service notes, and district conferences.

Subject-matter integration varies according to circumstances. Consider the case of a dairy inspector *cum* adviser whose stated responsibilities do not extend far beyond dairy hygiene. If, on a farm visit, his advice is sought on better feeding, he may make general suggestions on pastures, fodders, and supplements if he is competent to do so. He would then inform the local agricultural adviser and cattle husbandry adviser of the situation, and each of these would follow up if necessary. In the event of these advisory officers considering specialist advice necessary on, say, pasture improvement and debility of stock, the assistance of an agrostologist and a veterinarian would be sought. Advisory officers are encouraged to study in a wider field than their own narrow specialization to equip themselves to serve producers better, but they are not regarded as general practitioners and are expected to remain within their field of competency.

Farm Management Extension

The Department of Agriculture and Stock has not yet entered the field of farm management extension. The main reason for this has been the lack of sufficient basic data on farm enterprise costs and returns to enable sound economic advice on management to be given. An Economics Research Branch established in 1958 has been slowly built up in strength and is gradually obtaining information by field surveys and other means. It is expected that the application of the information by farm management extension will be undertaken in the not too distant future.

The Bureau of Sugar Experiment Stations does not do farm management extension.

Use of Media

There has been an increasing use of mass media and group methods by most Branches of the Department of Agriculture and Stock in recent years, but individual advisory work remains a very important medium.

Much of the mass media and group work is done by individual extension officers, in some cases in association with primary industry groups. There are no regional journalists or extension aids officers. An Information Branch at Head Office prepares the monthly agricultural journal and a weekly press and radio sheet, and some Branches provide special assistance to field officers in the preparation of literature and visual aids. Provincial dailies in some centres give extension officers a good deal of space, largely because these papers can get special advertising for farm pages and allot reporters to collect items from local officers. In the smaller country towns there is generally a weaker liaison and, unless local officers are enthusiastic about using the press, agricultural items printed may merely be handouts from Head Office.

Extension broadcasting is limited to ABC Country Hour talks, items on ABC Country Breakfast sessions, a weekly tape despatched from Head Office to all radio stations, and two or three regular sessions (unsponsored) on country commercial stations. No time is bought. Television is at present serving mainly non-rural people and little agricultural material has been programmed. Exhibits are displayed at a number of agricultural shows.

Field days, tours, and film evenings account for most of the group contacts. The remainder are made at meetings of a few discussion groups and at up to six schools per annum.

A proportion of the individual contacts is made by inspectors *cum* extension officers operating in the field. Some, including dairy officers and plant disease inspectors, visit all the farms in their territory; others, such as stock inspectors, are not roundsmen, except when engaged in special campaigns. Officers engaged primarily in extension may visit properties mainly on request or may attempt to cover their area in an organized fashion.

Use of Libraries

Limited libraries of books and periodicals are held by each Branch at each country centre. Extension officers have access also to the holdings of the Central Library, which operates borrowing and circulation systems for periodicals, books, etc. Monthly Central Library loans to all borrowers range between 300 and 400, and the number of copies of periodicals circulated averages about 1,400 per month. A scientific officer is engaged full-time in preparing abstracts of articles in periodicals for distribution to technical officers, including extension officers.

In-service Training for Extension Workers

In-service training is given in subject-matter and extension methods. Subject-matter training is undertaken largely on a Branch basis. The frequency of refresher courses and conferences is determined by the availability of Branch funds. It cannot be claimed that refresher courses for any particular category are conducted as often as is desirable, but in most financial years provision is made by the Department for one or more subject-matter courses. Training in extension methods has been conducted at special schools since 1953. The annual throughput of officers with some extension responsibilities is about 64; so far no officer has attended more than one school.

A rule requiring officers to pass internal examinations in administration, legislation, subject-matter, and extension methods in order to qualify for promotion from lower technical grades through to the senior adviser grade (non-graduate) imposes on the lower grades the need to keep up-to-date on these matters. The Department facilitates this by providing information circulars, current literature, and other requirements.

SPECIAL SERVICES

The central information service of the Department of Agriculture and Stock is provided by a separate Branch which deals with printed publications, press releases, radio liaison, extension methods training, and miscellaneous matters. No farm home extension service is provided in Queensland. The absence of an agricultural bureau in the State precludes any serious thinking on farm home extension at present. The Queensland Junior Farmers' Organization conducts its operations in association with the Department of Education. It has 169 Clubs, with 5,000 members between the ages of 15 and 25. The Clubs conduct their own activities, but each has an Advisory Committee of local people, including in many cases an officer of the Department of Agriculture and Stock.

PAPER 4

AGRICULTURAL EXTENSION SERVICES IN SOUTH AUSTRALIA*

Agricultural extension work in South Australia is almost exclusively a function of the Department of Agriculture. Others, of course, contribute. The staff of the Waite Institute and C.S.I.R.O. occasionally appear before the farming community, but in all cases this is by special invitation to address meetings on some special subject. There is for them no organized or continuing programme. The stock firms also provide service with some of the general characters of extension. Agricultural chemical firms work similarly, and Fertilizer Sales Ltd. maintains a limited staff of 'extension officers'.

One, of course, cannot exclude the organizations controlling certain media for mass communication, particularly the weekly agricultural press and the radio stations, especially A.B.C. Each of these maintains a staff of agricultural reporters who act not only on their own initiative, but also in very close liaison with the Department of Agriculture through the Division of Extension Services and Information.

HISTORY OF DEVELOPMENT OF EXTENSION WORK IN SOUTH AUSTRALIA

Extension work in South Australia has grown largely out of self help and was started in the 1880s by two organizations: the first of these was Roseworthy College and the second, the Agricultural Bureau, was formed four years later. Roseworthy College struck quick success with superphosphate, and by 1900 its use throughout South Australia was being actively promoted by Professor Lowrie. The Central Agricultural Bureau, with Molineaux as Secretary, and consisting of a small body of leading agriculturists, set itself the task of finding suitable agricultural plants for the rapidly developing agriculture. Almost anything that grew elsewhere was worth a try, and the early records of this body provide most interesting reading. Out of this Central Agricultural Bureau grew the present Agricultural Bureau organization and its controlling body—the Advisory Board of Agriculture.

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* Compiled by the South Australian Department of Agriculture.

In the first decade of the present century a horticulturist (Quinn), a viticulturist (Perkins), and a poultryman (Laurie) were appointed to the staff of the Department of Lands. Roseworthy College carried the cereal interest. A Department of Agriculture with functions separate from those of the Department of Lands was set up in 1907. The late A. E. V. Richardson was a very early member of the staff for a short period.

Emphasis early in the piece was given to the development of experimental farms in all parts of the State — Kybybolite, Minnipa, Turretfield, Berri, Blackwood, Vietch, Booborowie, Melrose, Hammond, and perhaps some others. These farms contributed much to the early development of South Australian agriculture, but they met political difficulties in the depression of the early thirties when only Kybybolite, Berri, and Blackwood survived in their original form. Turretfield was given over to the production of seed wheat, and for a time Minnipa was share-farmed. Fortunately for South Australia, both Minnipa and Turretfield were later reinstated to their research function, and new centres have been opened at Parndane on Kangaroo Island, Wanbi, Nuriootpa, and Loxton. South Australia has traditionally carried a very strong interest in horticulture and viticulture from earliest times.

Roseworthy College has operated continuously, and its main contribution to agriculture, apart from the supply of diplomates, has undoubtedly been through cereal breeding.

One of the things that accounts for the character of the South Australian Department of Agriculture is the existence of the Waite Institute — established about 1925. Government in supporting the Waite has taken the view, quite strongly at times, that any research for agriculture should be done there rather than in the Department of Agriculture. This set the Department back for many years, but more recently the need for field stations and applied research has been recognized, and a quite substantial research staff is now attached to most branches in the Department of Agriculture.

Technically, the Department of Agriculture was quite weak in numbers until after World War II. The increase in the last 12 years has been spectacular.

The first move towards the development of a decentralized extension service came during 1924–1926, when 8 District Agricultural Advisers and 4 District Dairy Advisers were appointed. These men advised in the broad field of agriculture, without specialization except that which was dictated by the district in which they worked. They were for all practical purposes cast in the mould of the county agent as we now know him, except that specialist backing was then quite limited too. By 1940 there were still only 45 technical officers in the Department, but by this time District Advisers were attached also to the Horticulture Branch. Livestock specialists have also been added to the Department, and in the late 1940s the Stock and Brands Department, which had previously operated in the field of animal health, was amalgamated with the Department of Agriculture. Motivated by serious wind and water erosion troubles throughout the State, a Soil Conservation Branch developed also in the 40s.

So by 1950 the Department of Agriculture consisted of a Director of Agriculture and 7 Branches — Agriculture, Horticulture, Dairy, Soils, Animal Health, Animal Husbandry, and Poultry. Poultry has since been combined with Animal Husbandry. From 1948 to 1955 there was tremendous expansion in technical staff. Numbers grew from about 50 in 1948 to almost 200 by 1955. This expansion brought its problems. The proportion of inexperienced staff to seniors was too great. The administrative machinery was also inadequate to cope with the new situation. There was also the unsettling influence of a new race of agricultural extension workers with university training as distinct from diploma holders.

The problem of classifying technical staff into extension officers and otherwise had been foreseen by the Organizing Committee. Within South Australia, extension, research, and regulatory duties are so inextricably interwoven that, irrespective of classification and title, it is impossible to sort them out as applying to officers in general. Some are essentially extension officers, others spend most time on research, while a third group is largely involved in regulatory duties. Most, however, have some part in all three functions. There can be argument about the wisdom or otherwise of such an arrangement. It must be remembered, however, that our Department is still relatively small and for reasons of efficiency, duties, whatever their nature, must if possible be performed by the man on the spot. If such an arrangement be 'evil' we are forced to accept it as necessary, but there are contenders in our service who recognize it as even being desirable. Certain Branches claim that their regulatory functions, conducted in the modern way (public relations to the fore), provide points of contact that would otherwise be difficult or impossible.

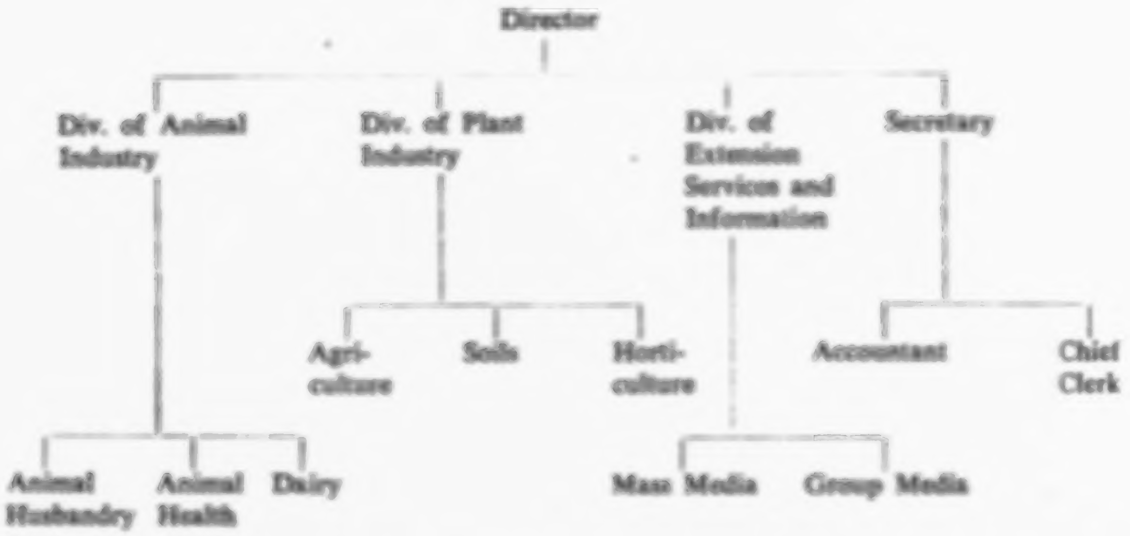
Reconstruction

In 1952 the Department was reorganized into Divisions recognizing four major groups of activity — Animal Industry, Plant Industry, Extension Information, and Secretarial. This was a major undertaking that took some time to settle down. Before it was finally settled there were many direct and consequential moves of staff who had to become accustomed to new jobs and new procedures. An outline of the structure is shown in Table 1.

The interesting part of this experiment, from the point of view of both the Department and outside, was the creation of the Division of Extension Services and Information, which was an entirely new development for South Australia. The new Division was to manage the general strategy for Departmental extension work. It was to train staff for their extension function and to administer directly the Library, the Journal of Agriculture, press work, and radio work.

In-service training schools in extension methods have been conducted regularly since 1952. Each year (excepting one) a group of about 30 extension officers have spent up to a fortnight in residence at Roseworthy College. The courses have covered the principles of social psychology and sociology as they apply to agricultural extension work, and practical training has been given in radio, press, public speaking, and the various methods used by extension workers. The effect

TABLE 1


Director
Div. of Animal Industry
Div. of Plant Industry
Div. of Extension Services and Information
Secretary
Agriculture
Soils
Horticulture
Accountant
Chief Clerk
Animal Husbandry
Animal Health
Dairy
Mass Media
Group Media

of these courses has been quite spectacular when viewed in the light of improved standards of performance of Departmental officers.

Over the years, too, the Journal of Agriculture has substantially changed its format. It has been clearly established as a journal for farmers, and all changes have been introduced with the idea of improving readability and the attractiveness of the layout. All Bureau members get the Journal free, but there is also a substantial list of subscribers, which is increasing rapidly. Present circulation is something over 13,000.

Radio talks, which are given regularly over State and regional stations of the A.B.C. and one commercial radio station, also have a very good following. Television is also used when the opportunity presents itself—mainly for news flashes.

One of the major activities of Extension Division has been the development of coordinated extension programmes, using the various methods in their appropriate place. This has also been its most difficult task. There is a very strong feeling among extension workers that they must do things their own way and there is, of course, some justification for this. Nobody works well with a medium they neither like nor can use well. This accounts for a tremendous perponderance of time given to farm visiting—perhaps the most effective method, but certainly not the most efficient for all things when extension workers are thinly spread and there is not sufficient time to go round.

FARM MANAGEMENT

Another development of recent years—also within the Division of Extension Services and Information—has been the Farm Management Advisory Service. At present this consists of two economists and two clerks working in conjunction with all District Advisers. The economists and their clerical staff analyse farm records to pinpoint problems in farm management. The District Adviser uses this information to work with a few selected farmers, so that he might learn something of the managerial problems of farms in his district. The farmer of course gains substantially in the process, but because of the time and personnel required it would be impossible to provide such a service to all farmers.

At this time, when it is obvious that the major problems of farmers are managerial, it is vitally necessary that extension advice be given in a management framework. For most States, and certainly for South Australia, where District Advisers have become more and more specialized, this is an almost insuperable task. The specialist adviser has great difficulty in being general enough to fit the bill. Experience has shown, however, that all advisers who have worked on a few farms in this way are much better equipped to work with all other farmers in their districts. To develop this sort of understanding is the prime objective of the Farm Management Advisory Service as it is operating in South Australia.

Farm Management Clubs

Related to the Farm Management Advisory Service is the present interest in Farm Management Clubs. Only one is at present operating, but interest is developing at five other centres.

The Department sees no threat from such a development. We believe they may be a useful and complementary activity to existing services. Much, however, depends upon the way they develop. If they develop with the idea of being complementary to existing Departmental services, there is every prospect of success. There can be no grounds for the suggestion that farmers, by forming themselves into such Clubs, are providing something better than the Department can give. We believe that it is not a question of being better or worse, but something different. With this in mind the South Australian Department is quite interested in the move. Time alone will produce the answer to many questions that are being asked.

DECENTRALIZATION

South Australia favours, and where possible develops, a decentralized form of extension with a number of specialist extension officers working from one centre — sometimes also a research centre, but more usually a business centre in the area. A central office is maintained at most centres, but administratively each officer is controlled through his Branch head in Adelaide. Coordination of activities is encouraged and developed through frequent contact between the men themselves and periodic group meetings when necessary. The senior officer of the group is officially recognized as group leader for this purpose, but receives no special recognition for the duties involved.

Regional groups of this kind operate from Nuriootpa, Jamestown, Pt. Lincoln, Cleve, Minnipa, Murray Bridge, Keith, Naracoorte, Mt. Gambier, and Loxton. Quite a few officers work singly at other centres where necessary. For our purposes, again recognizing the sizes of the Department and the area concerned, such an arrangement works satisfactorily enough. All officers maintain regular contact with specialist research officers attached to Head Office or in some cases to research centres. Apart from coordinating visits by officers from Extension Division, supervision of each officer working at a regional centre is the responsibility of the head of the Branch or more particularly the senior adviser in the Branch concerned.

RESEARCH–EXTENSION LIAISON

This of course is always a problem that seems to increase with size. South Australia has the Waite Institute, numerous Divisions of C.S.I.R.O., and the Institute of Medical and Veterinary Science. It also has effective branches of the A.I.A.S. and A.V.A., and an Animal Production Society. Through these, plus relative freedom for interstate exchange visits and the personal contact that is possible in a relatively small community, liaison works quite effectively. While recognizing the need for C.S.I.R.O. to have a public front and report to the public, there are some who are still concerned about what are considered as unwarranted intrusions into the extension field by that Organization. The improvement in this respect in recent years has been tremendous, and it appears that we are now on the threshold of an understanding that cannot but be advantageous to both parties.

LIBRARY

The Department of Agriculture conducts a very effective library service, not only for its officers, but, through an exchange system with other similar libraries, for all. The superabundance of text books now appearing on the market makes the maintenance of a complete library impossible. The emphasis is upon original sources, and selected text books only are purchased. Through the Commonwealth Extension Grant it has also been made possible to develop a series of standard references appropriate to the needs of extension officers working from country or regional centres.

LIAISON WITH INDUSTRY GROUPS

Particularly in certain sections, notably Horticulture and Animal Branches, the Department maintains a very close working relationship with the various industry groups.

Technical information and discussion are provided wherever appropriate, care being taken to avoid political embarrassment. This is not always possible, but the few breakdowns that do occur appear to be more than counterbalanced by the mutually advantageous situations that arise.

Special attention should perhaps be focussed on working arrangements with the Metropolitan Milk Board, which is responsible for supply and marketing of whole milk within the city of Adelaide. Because of rapidly expanding demand, the area from which 'city milk' is drawn is extending all the time. Regulations operated by the Board and supervised by its officers have had the effect of 'squeezing' the Departmental dairy officers from some areas. This means that the Departmental interest in dairying is being concentrated on butter and cheese and their manufacture in areas that are naturally becoming smaller and smaller.

THE EXTENSION SYSTEM AND USE OF MASS METHODS

South Australia strongly recognizes that extension is in itself a social system, requiring for its success a thorough understanding of subject matter, methods, and the social and economic character of the people concerned. It is thought that the major deficiency at this time is the lack of understanding of the human aspects of the task. This is brought about by a lack of knowledge of the basic elements of social psychology and sociology, and particularly specific knowledge on these matters for Australian rural communities. The problem will persist until such time as specialized study in this field is considered essential for extension workers. Much can be done with in-service training, but more specialized research in this field seems equally essential.

We believe that a well founded extension service will use all the media for mass and group communication, and vary the tool according to the state of understanding of the person or persons being educated.

It goes almost without saying that the modern means of mass communication — press, radio, and television — offer great things for extension services. What can be achieved by the use of mass media should never be attempted by the expensive method of farm visiting. Extension programming in the South Australian Department of Agriculture aims at giving effect to this. Because of the deep-rooted faith of extension workers in the farm visit as the multi-purpose and most successful method, we are only partially successful.

As stated previously, the South Australian Department of Agriculture produces a monthly Journal of Agriculture. We also produce press bulletins covering about five subjects on each of two days per week. These are well received and accepted by city and country press, and seldom are our releases modified by editors. The secret of success seems to be to learn what editors require and produce it. Radio and television have already been referred to. The first steps towards developing films specially adapted to our purpose have also been taken and two films, Gummosis and Cape Tulip, have now been completed. Others are on the way. Except by special arrangement with the agricultural press, no attempt is made to produce the longer article required by the weekly agricultural papers. We provide all the help required by staff reporters, and in this way ensure (if such is necessary) the continuity of employment for agricultural reporters employed by the various papers. This provides a valuable supplementary force to that employed by Government organizations and is for the betterment of all concerned.

Group Media

Apart from the associations which the Department has with industry groups already referred to, the Department is singularly fortunate in having attached to it the men's Agricultural Bureau, the Women's Agricultural Bureau and the Rural Youth Movement (both Seniors and Juniors). Each of these organizations is controlled by a 'council', in one instance elected (W.A.B.) and in the others appointed (A.B. and R.Y.M.). The Department is represented on each of these councils, but, with the exception of R.Y.M., membership of the governing body is drawn from the movement. In the case of R.Y., a State committee, sitting immediately beneath the council and reporting to it, is fully representative of the movement and consists entirely of its members.

In each case the Department of Agriculture provides organizational and technical staff, and in this way is able to ensure the development of each body along the most productive lines for adult education in agriculture. Social and service functions for each organization are also recognized, particularly in W.A.B. and R.Y.M. Each organization is expected to develop on the self-help basis, with the Department providing specialized technical help where necessary. Through these organizations the Department has direct contact with some 13,700 persons in 404 separately organized groups, which constitutes a very fair coverage of the 25,000 odd farms in South Australia. Specific figures are as follows:

Agricultural Bureau	7,800 members in 230 branches
Women's Agricultural Bureau	2,400 members in 74 branches
Rural Youth Movement	3,500 members in 100 clubs

With the scatter of branches that exists throughout the State, it is possible to discuss problems of importance to agriculture with a non-political non-sectarian group at very short notice — a group whose primary purpose for existence is agricultural education. The advantage to be gained from such a set up will be well recognized.

A quick assessment of the use of group media by the Department for year ending June 30, 1962, is shown in Table 2.

TABLE 2

Agricultural Bureau meetings	801	with av. attendance of about	20
General field days	174	with av. attendance of about	40
Hogget competitions	23	with av. attendance of about	100
Carcass competitions	4	with av. attendance of about	100
District Regional Meetings —			
Men's Agricultural Bureau	22	with av. attendance of about	91
Women's Agricultural Bureau	11	with av. attendance of about	110
Rural Youth	23	with av. attendance of about	140
Schools —			
Beef Cattle	1	with av. attendance of about	20
Sheep Management	1	with av. attendance of about	25
Soils	2	with av. attendance of about	30
Weeds	3	with av. attendance of about	35
Farm Management	1	with av. attendance of about	30
Crutching	5	with av. attendance of about	12
Shearing Shed Management	7	with av. attendance of about	12
Agriculture for Women	2	with av. attendance of about	30

PAPER 5

AGRICULTURAL EXTENSION SERVICES IN WESTERN AUSTRALIA*

It is the aim of this paper to outline the history, development, and present structure of the Western Australian Department of Agriculture in relation to the dissemination of agricultural advice, the various media used, and the organization involved.

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* Prepared by the Western Australian Department of Agriculture.

The concept of extension services is variable in terms both of periods of development of the Department and of the individual officers of the Department. Although it is acknowledged that extension in its broadest sense is an educative function whose end-product is increased agricultural conservation and production, it has not been possible to analyse the Department's activities in these terms. Factual evaluation has therefore been largely confined to the changes in numbers of extension units and their organization in relation to other Departmental functions.

For the purpose of this paper, one extension unit is a full-time advisory officer, whether located at head office or in the country. Research and specialist officers who are not confined to their laboratories, but who publish their results in the Journal of Agriculture, give broadcast talks, and attend formal field days, meetings, and sometimes lesser farming groups are accorded one-quarter of a unit. Some categories, such as Dairy Instructors who have regulatory functions with regard to factories in addition to dairy premises, are half units.

Groups of officers whose primary function is regulatory, although some advice may be given, are disregarded as extension officers. These include vermin control officers, fruit fly inspectors, and market and export inspectors. Herd recorders are not included although the records obtained are utilized for extension purposes. These exclusions in no way detract from the usefulness of these officers, many of whom have technical qualifications and in the course of their duties disseminate valuable information gleaned either from their experiences or from results of local research — e.g. vermin control officers. Their exclusion makes it easier to measure the growth and structure of extension services quantitatively.

History

The history of extension is in effect the history of the Department of Agriculture, which had its origin in the Bureau of Agriculture, founded in 1894. In 1898, 80 years after settlement had started, the Department of Agriculture was established and absorbed the staff of the Bureau.

The 'State Farms'

In those times there was little comprehension of the technical problems associated with land development and even superphosphate was not used, but expansion of farming brought demands on the Department for State farms. The first of these was established at Hamel in 1896. By 1907 Government 'farms' were established at Narrogin, Nabawa, Nangeenan, and Brunswick. They functioned as 'demonstrational farms', giving early settlers a lead in development of their own properties. These farms, now known as research stations, had a marked influence on agricultural expansion. In later years, research stations were also established in the cereal and sheep districts of Wongan Hills, Beverley, Newdegate, Salmon Gums, and Esperance. There are also now three stations serving the dairying industry: at Wokalup, Denmark, and Margaret River. Research stations serving the horticultural industry have been established in the last ten years or so at Stoneville (fruit), Swan (viticulture), Herdman's Lake (vegetables), and Manjimup (tobacco). The Kimberley Research Station (operated in conjunction with the C.S.I.R.O.), Abydos near Port Hedland, and the Gascoyne at Carnarvon serve our northern and tropical areas.

Although these stations have played an important role in the extension of agricultural knowledge, the appointment of Mr. (now Dr.) G. L. Sutton as 'Agricultural Commissioner for the Wheat Belts' in 1911 and Prof. J. W. Patterson to the Chair of Agriculture, University of Western Australia, were probably the main break into the era of scientific agriculture. 'Extension' was severely handicapped by long distances, and lack of transport and trained officers.

Staffing Problems

A major change in the structure and organization of the Department took place in 1922 with the introduction of cadets and the appointment of two university graduates, one being Mr. G. K. Baron Hay, who retired recently as Director of Agriculture. Early Commissioners were appointed on a regional basis, e.g. Commissioner for the Wheat Belts and Commissioner for the South West. The structure of the Department then changed to an 'industry' basis with additional branches of research and specialist officers. Appointments were largely made as a result of industry pressure: e.g. the apiculturist was appointed at the request of the beekeepers that they might be assisted to increase honey output and prevent the spread of disease; the viticulturist was appointed to assist with the development of the wine industry and to advise vignerons. Additional agricultural advisers were appointed to assist the men on the land, several being stationed in country districts.

Since 1929 it has been possible to assess the expansion of extension in terms of unit values, as shown in Table 1.

The outstanding trend in the expansion of extension is the marked influence on recruitment of staff of the depression years. This was followed by a short period of rapid development until the war years again brought recruitment to a veritable standstill. The disastrous effect of the depression and war years on the growth and development of extension services cannot be overestimated. Essential wartime activities took precedence over educative measures; added to this there were strong sociological or psychological forces acting against the scientific training of personnel and stationing them in country districts. These unfortunate periods in our history have undoubtedly left their mark not only in the gaps in our recruitment, but in the outlook of the farming community. These age-group gaps between administrators who were appointed in the twenties and post-war graduates have not been conducive to either decentralization of extension or efficiency. A sound policy of continuous recruitment is obviously essential.

The very rapid expansion which took place in pasture development in the post-war years created increased demands on advisory services. Farmers showed a quickened interest in field days, mainly held at research stations. There was a spectacular increase in the number of 'pasture groups' operating, the first one having been developed in the Miling area by the District Adviser, Mr. G. L. Throssell. These groups were initiated to promote the establishment of improved pastures and proved an effective instrument for extension, mainly through group interest and cooperation.

TABLE 1

Year	Total no. of staff	Number of extension units				
		Graduates	%	Non-graduates	%	Total no. of units
1922	N.A.	1½	50	1½	50	3
1928	279					
1929	N.A.	13	75	4⅓	25	17⅓
1930	N.A.	14	75	4⅔	25	18⅔
1934	N.A.	12¾	75	4¼	25	17
1938	N.A.	22¼	60	15¼	40	37½
1946	N.A.	27¾	68	13¼	32	41
1953	578					
1954	561	52	68	25	32	77
1955	634					
1956	650					
1957	699					
1958	710					
1959	760					
1960	752					
1961	819					
1962	862	64½	66	41½	34	106

Note: Total number of staff includes:
Permanent officers
Temporary officers
Wages employees
N.A. = not available. Prior to 1953 (and except for 1928) details as to wages employees not recorded annually.
Percentage extension units to total staff 1954 and 1962 approximately 12½%.

North West

Although there had been individual officers appointed for the north-west of the State it was not until after the war that Kimberley and Abydos Research Stations were established. These were later grouped with the Gascoyne Research Station under the North West Branch (later North West Division), to which three graduates were appointed. It is of interest to note that the remoteness and tremendous sizes of these areas necessitated the establishment of a Division on a regional basis. This can be compared with the appointment of the Commissioners for the Wheat Belts and South West at the turn of the century.

Post-war Developments

Since World War II, it is difficult to fully appreciate the effect on extension of improvements in transport and other means of contact with the farmer such as the press, Departmental journal and leaflets, radio, films (including the Departmental film units), and, more recently, television. The greatly improved level of education through improved teaching methods, expansion of the Education Department and the University, the formation of Junior Farmer Clubs, and various forms of adult education will have an increasing effect. Although these changes will better enable the farmer to appreciate and utilize technical facts, they will as surely create a greater recognition of his many problems and a thirst for more knowledge, through the extension services.

The growth of the agricultural industries' requirements ultimately led to the formation of 17 separate Branches (1950), each in effect responsible for its own extension. In 1954, for purposes of administration it became necessary to amalgamate them into 6 major Divisions with a number of miscellaneous Branches including Botany, Plant Pathology, Entomology, and North West Branches. These were later formed into the Biological Services and North West Divisions, making a total of 8 Divisions.

In 1954 two regional advisers were appointed in recognition of the value of senior advisory officers and it was from about this time that greater decentralization of advisory services became apparent.

As a result of a visit by Mr. F. L. Shier, then Superintendent of the Wheat and Sheep Division, to New Zealand in late 1953, a report was submitted the following year on extension services, advocating a policy of decentralization. The following recommendations were made:

1. Organization on a Divisional basis with a minimum number of Divisions involved in extension
2. Decentralization with location of officers in the country
3. The grouping of officers of each Division at district offices with appropriate clerical and office facilities
4. The setting up of an information and publication section under an experienced agricultural graduate
5. The formulation of a plan for regular recruitment of staff
6. The organization of refresher and instructional courses under (4)
7. Assistance for travel and postgraduate study for extension officers

These recommendations conveyed the conception of an extension service on the same basis as other services — such as district schools or hospitals — and with elaboration on training of officers, coordination, and direction would largely achieve the goal of an efficient extension service.

From 1954 onwards many improvements took place. District accommodation (in most cases with clerical and stenographic assistance) has been provided at 21 country centres. To increase the already improving flow of university graduates to the Department, agricultural science cadetships were reintroduced in 1955 and financial assistance to cadets was increased appreciably in 1961, with resultant improved recruitment. Also in 1961, a well qualified agricultural science graduate experienced in journalism was appointed in charge of the Publicity Section.

CURRENT STRUCTURE

As will be apparent from the history of the Department there is no separately organized extension service, so in order to obtain a picture of extension activities it is necessary to examine the structure of the Department as a whole.

The Department's activities are organized under a series of Divisions, the heads of which are responsible to the Director of Agriculture. Other Branches of the Department are Muresk Agricultural College (teaching functions only), Abattoirs, and Vermin. The 'Library', 'Rural Economics and Marketing', and 'Publicity' sections are located under Administration.

The reasons for this organization on an industry basis are largely historical and geographical. The development of activities such as wheat and sheep farming, dairy farming, and fruit-growing took place within well defined climatic and geographical limits, defined usually by rainfall, and early organization of the Department followed the same pattern. This geographical separation of industries is still, in most cases, clearly defined, with little overlapping of farming activities as compared with other States. It is considered that a structure based on these broad divisions forms a satisfactory framework for extension services.

The eight major Divisions are Animal, Wheat and Sheep, Dairying, Horticulture, North West, Soils, Plant Research, and Biological Services. The North West Division, the most recently created, deals with the agriculture of the North West on a regional basis. Because of the demands of the various industries, officers appointed on an industry basis in the more heavily populated areas of the South West have been unable to associate sufficiently with agricultural developments in the North West with its remoteness and tremendous distances. The North West Division staffs the four research stations of the region, maintains advisory staff, and is assisted in its functions by officers of the specialist Divisions.

Although it is accepted policy that extension is a major function of the Department, the rapid development of this State's agriculture and the many demands by various industries for services and regulatory functions have further drawn on staff already depleted by lack of recruitment in the depression and war years.

The Department is viewed by many as being largely advisory in function, but in fact the pressure of other activities has been dominant. Table 2, which is compiled from a functional split-up of total finance from Consolidated Revenue Fund, Trust Funds, and Commonwealth Grants, indicates that 16% is expended

TABLE 2

EXPENDITURE 1960/61

TOTAL EXPENDITURE ITEMS

1. General administration	£159,835	10%
2. Extension activities	£193,090	11%
3. Research	£144,962	9%
4. Research stations	£268,597	16%
5. Other activities	£933,029	54%
Total	£1,699,513*	

* Total expenditure comprises monies from three sources:
1. Consolidated Revenue Fund
2. Trust Funds
3. Commonwealth Grants

TABLE 3
EXTENSION OFFICERS AS AT 31ST MARCH, 1962

	*Total number officers	University graduates — agriculture		University graduates — other faculties		Agriculture college — diploma-holders		Others				Total units
								Some technical qualifications		No technical qualifications		
		Head office	Country centres	Head office	Country centres	Head office	Country centres	Head office	Country centres	Head office	Country centres	
Horticulture Division	32	† 3	† 5	†	†	† 1	† 3	†	†	† 5	† 10	27
Plant Research Division	10	2½										2½
Biological Services Division Pathology Entomology Weeds & Seeds Botany	28	1½ 2¼ 1½ ¾				¼	½			¼	1¼	8¼
Dairying Division	24	2	8			1½	4½		1			17
Wheat and Sheep Division	26	2½	16						2	3		23½
Soils Division	18	1¾	8				2	¾	1½			14
North West Division	8	1½	1½	1							1	5
Animal Division	18	1¾		1¾	2¼	1				2		8¾
Totals: Head office Country centres		21	38½	1¾	3¼	3¾	10	¾	4½	10¼	12¼	37½ 68½
Grand totals	164	59½		5		13¾		27¾				106

* Part-time officers included in totals. † Converted to full-time units.

2

on research stations, 11% on extension, 10% on general administration, 9% on research, and 54% on other activities. Expenditure has been largely apportioned on a staff basis, salaries and attendant costs being grouped according to the officers' prime functions. The so-called other activities include inspection, vermin control, herd testing, etc. Research stations, which represent 16% of expenditure, also have a high extension value through field days and individual visits by farmers.

The eight Divisions of the Department all carry out some extension, whether they are regional, industry, soils, biological, or research. Major points to emphasize are:

1. All Divisions carry out extension. The Plant Research Division largely confines itself to mass and group media. In the Biological Services Division individual extension is largely through correspondence and visits to head office; this suggests technical services rather than extension on a 'whole-farm' basis from the non-regional or industry Divisions.
2. Non-extension activity dominates the industry Divisions, particularly Horticulture.

The Soils and industry Divisions have officers located through the State. Wherever possible they are grouped together in a district office. A district officer is appointed whose administration is confined to office and office staff administration, the various extension officers being directly responsible to the heads of their respective Divisions.

The other activities of the industry Divisions include inspection services, plant and animal quarantine, fruit fly control, etc. It is well known that, because of the urgency of regulatory and service functions, these take precedence over educative functions. This must raise the question of how extension can be streamlined and removed from the incubus of administrative, marketing, and regulatory functions.

STAFF

Appointments are made to positions categorized as professional, technical (general), or clerical. The requirement for professional officers is a Bachelor of Science degree (in agriculture or its equivalent). In the case of veterinary officers a Bachelor of Veterinary Science or its equivalent is required. For many years it has been a policy of the Department to appoint only university graduates to agricultural adviser positions. While this has limited the 'number' of extension workers available, it has maintained the quality of advisory work at a high level and given a sound basis for future development of the extension service.

Preference is given in technical appointments to holders of a diploma of a recognized agricultural college. In the absence of a diploma, most technical appointments give preference to holders of the Leaving Certificate including English, maths, and science subjects and promotion depends on a technical training course arranged by the Department.

Table 1 sets out the staffing position in various years until March, 1962. The number of extension units has been assessed for early years on a similar basis to 1962, allowance being made for less administration by some officers in the early years. It will be noted that the proportion of extension staff to total staff was the same in 1954 as in 1962 (12½%). Similarly, the proportion of graduate to non-graduate staff has remained surprisingly constant since 1946, when the proportion was 68% graduates. In 1954 and 1962 it was 68% and 66% respectively. Table 3 shows the number of extension officers as at 31st March, 1962, in Divisions and the total number of extension units. These units are again divided into categories of graduates, diplomates, and others.

The figures for 1962 are tabulated in Table 4 for comparison with other States of the Commonwealth.

TABLE 4

Total Departmental personnel (including wages staff)	862
Total scientific staff (professional staff)	131
Other staff (difference)	731
Total no. of officers engaged in extension*	164
Full-time extension officers	71
Part-time extension officers	93
Full-time equivalents	106
Acres of pasture per extension unit	77,000
Acres of crop per extension unit	64,000
Rural holdings per extension unit	208
Farm population per extension unit	832

* Details of their qualifications are shown in Table 3.

Trends in the numbers of extension units compared with agricultural development dating from 1922/23 are shown in Table 5. It will be noted that staff is more than keeping pace with cropping, but there have been periods when pasture development has taken place more rapidly than increases in extension units. The numbers of rural holdings and farm population are declining in relation to extension units. It is pointed out, however, that these factors may not be any direct measure of extension requirements. These latter are a complex related to demand, which in itself is affected by the quality and quantity of extension.

The number of extension units has not been related to total area of the State or to pastoral holdings as it is considered that the figures would be meaningless.

Decentralization of Extension Staff

In recent years it has been Departmental policy to decentralize officers, grouping them as far as possible into district offices. This has obvious advantages for administration, liaison, accommodation, and stenographic and clerical assistance. These in turn lead to improved status and efficiency. Table 3 shows the appointment of officers in Divisions to country areas or head office. Of a total of 106 units, 68 are located in country areas. Some of the officers located at head office directly serve adjacent fruit, vegetable, and dairying areas. Some officers in the Soils and North West Divisions can serve remote areas of the State as well from Perth as from relatively small and isolated country towns. The Biological Services Division, Plant Research, and Animal Research are wholly located in Perth for the advantages of direction and laboratory and library facilities.

TABLE 5
RELATIONSHIP BETWEEN AGRICULTURE AND EXTENSION SERVICES OF THE DEPARTMENT OF AGRICULTURE

Statistical year	No. of extension units*	Pastures		Crops		Rural holdings		Total farm population	
		Area of established pasture ('000 acres)	('000 acres) per 1 extension unit	Area under crops ('000 acres)	('000 acres) per 1 extension unit	No. of rural holdings ('00)	('00) rural holdings per 1 extension unit	Farm population ('00)†	('00) persons per 1 extension unit
1922/23	3	25	8	2,275	758	179	60	N.A.	—
1928/29	17½	324	19	4,566	267	211	12	N.A.	—
1929/30	18¾	339	18	4,792	256	219	12	N.A.	—
1934/35	17	501	29	3,839	226	229	14	N.A.	—
1938/39	37½	908	24	4,681	125	211	6	N.A.	—
1946/47	41	2,092	51	3,532	86	191	4	N.A.	—
1954/55	77	4,747	62	5,043	65	209	3	862	11
1960/61	106	7,687	77	6,757	64	220	2	882	8

Note: All data taken to nearest whole number

* Extension units taken to be applicable to adjacent statistical year

† N.A. = not available

Field Supervision and Coordination

With the existing district offices there is no local supervision of field staff, except in certain cases where there is more than one officer of a Division at a district office. Coordination and supervision of extension activity is the direct responsibility of Divisional heads. Such control is exercised largely through formulation of broad policies in various phases of extension, e.g. relationships with local agricultural organizations, Junior Farmer Clubs, etc.

District offices receive a limited number of visits from Divisional heads, their assistants, and senior specialist officers of the Divisions concerned. Major difficulties are the pressure of more urgent administrative and industry matters and the often immense distances and transport. Daily journals of duties and monthly reports must be maintained and regularly submitted by all field staff, and these are examined monthly.

It will be seen, therefore, that emphasis is placed on the resources of the field staff and development of the approach by the individual.

It is submitted that the existing structure favours uniformity of policy and supervision on a State-wide industry basis, but is not conducive to development and coordination of agriculture on a district basis, the preparation of district programmes, or the assessment of their effectiveness.

RESEARCH–EXTENSION LIAISON AND SUBJECT-MATTER INTEGRATION

There are broad and somewhat informal policies on liaison between research and extension.

Divisions engaged in research are expected to inform other Divisions who may be interested in their projects. In some instances where a research programme is related to an industry fund, or to a specific research station, there are formal committees comprising both research and extension officers who examine research programmes and resultant progress reports. In several instances farmer organizations are represented on these committees. If the inclusion of farmers does not materially assist in research programming it usually ensures earlier integration of research findings and their circulation to the farmer organizations concerned.

It is accepted policy and one of mutual benefit that, where practicable, research officers carry out research in conjunction with district officers. In the main the above policies are adhered to, but it may be assumed that, human nature being what it is, there will always be exceptions.

Annual reports of the Plant Research Division are forwarded to extension Divisions for circulating — monthly veterinary laboratory notes are sent to country veterinary officers — miscellaneous reports are periodically circulated from specialist and research Divisions for the information of country officers. Research and specialist officers attend conferences of extension officers and field staff of other Divisions. At these conferences the latest information on various aspects of investigational work is discussed to mutual benefit.

The appointment of an agricultural scientist with considerable experience in journalism as the publicity officer for the Department (whose duties include the production and editing of the Journal) has aided the integration of material for the benefit of the extension officer and the farmer.

Field days where research officers meet both extension officers and farmers are valuable in subject-matter integration.

The above coverage should not imply that there are not gaps in both liaison and integration of our work. It is felt that the recognition of senior extension specialists where necessary and a clearer definition of their functions in regard to assisting in the programming of research and the transmission and integration of results to extension programmes would be of considerable advantage.

FARM MANAGEMENT GROUPS, FARMER CLUBS, AND PRIVATE CONSULTANTS

Farm-management and private consultants have been adequately appraised by Dr. H. P. Schapper and co-writers in their report to the council of the Australian Institute of Agricultural Science (J.A.I.A.S. Dec. 1961). A paper on farm-management clubs is being submitted by Dr. H. Schapper and this subject needs no elaboration here. It is agreed that as advisory and consulting services develop they will take over some of the functions of the State Department's advisory service. They will, however, be complementary to it and increase the scope and efficiency of extension generally — provided they are organized with suitable standards.

The Junior Farmer Movement commenced in 1935 with the establishment of Harvey and Middlesex clubs on a voluntary basis. In 1957 the Junior Farmer Movement Act came into operation and an executive officer and extension officers were appointed. By 1959 there were 4 graduates in agriculture; these were joined by an arts graduate in 1961. By the end of 1961 there were 89 clubs. The function of the Junior Farmer Movement Act is stated in the preamble of the document. It is 'An act for the purpose of sponsoring and encouraging among youth the study of agriculture and farming, an appreciation of rural life, of education, and the ethics of good citizenship'. The Department of Agriculture has developed a basis for cooperation in providing occasional talks and literature to the movement. This is channeled as far as possible through headquarters rather than on an individual basis. Country officers cooperate in local activities. It can be appreciated that this movement will become of increasing value to agricultural extension — in educating and orientating country youth and encouraging group interest. These aspects are of more importance than the technical knowledge gained by the movement.

EXTENSION METHODS

Mass and Group Media

All divisions of the Department are concerned with extension by mass and group methods. Major dissemination is through the Journal of Agriculture, radio talks, field days, pasture groups, fruit-grower 'get togethers', industry conferences, etc. Increasing dissemination is taking place through the general press of special publicity — and the increasing activity of farm periodicals in printing articles inspired by the Department, and occasionally reprinting Journal articles and radio and other talks by officers. Such periodicals are the 'Farmers Weekly', 'The

Countryman', 'The Fruit Grower', 'The Potato Grower', 'The W.A. Grower', 'The Market Gardener', etc.

The Journal of Agriculture

The Journal of Agriculture is at present the only publication of the Department of Agriculture. The Journal is produced primarily as an extension publication but has only actively followed this policy for the past 10 years or so. During this time increasing emphasis has been placed on 'readability' and presentation with the aim of making it more attractive to farmers. Circulation is now 17,700, about 16,000 of which are issued free to farmers.

Film Unit

The Departmental Film Unit runs three vans, each forming a self-contained film unit. Staff comprises three projectionists, who operate the units under the administration of the Dairying Division. It is now accepted that the main value of the film evenings is in the bringing together of farmers for group discussion.

During the past year the Unit has also produced several local films of Departmental activity on a more or less experimental basis. These have been successful and well received and further work in this field is expected.

Individual Advisory Work

Individual methods are employed more widely by the industry Divisions and involve farm visits in response to requests — in connection with competitions, surveys, experimental work, or even regulatory functions. Other avenues for individual contact are through correspondence (also used by Biological Services and Soils Divisions), office consultations, and local or industry social functions. The use of individual methods is necessarily restricted by staff limitations, transport, and travelling costs — particularly in Western Australia, where agriculture is so extensive and distances great.

The Department's functions are, therefore, restricted to a great degree to technical advice — but it is accepted that the ultimate in extension services should be the individual visit and whole-farm approach including management and economic advice.

LIBRARY SERVICE

There is now a staff of four, consisting of one trained librarian, two trainee library assistants, and one clerical officer. Library services include selection and acquisition of material, processing of material and distribution of publications, and dissemination of information.

Considerable use is made of the library services and has been illustrated by figures kept for a number of years for items issued on loan to country officers. In 1953/54, 979 items were forwarded, as compared with 4,900 items in 1960/61. The Departmental library has been considerably aided by funds from the Commonwealth Extension Services Grant.

TRAINING OF EXTENSION WORKERS

The degree course in agriculture includes no special course in extension and it is necessary for officers to acquire training within the Department. The shortage of senior extension staff in the field has in the past limited the opportunity of placing graduates with 'seasoned advisers'. Previously, the graduates' first introduction to field advisory work was by their placement at various research stations, but this is now being superseded by placing them with senior field staff.

Although it is highly desirable for graduate extension officers to have training and association with research, it has been found in practice that officers located at head office develop social, academic, sporting, and accommodation affiliations which are not conducive to them taking up country appointments. Basic agricultural and extension training are necessary, but attitude is more important.

Most Divisions now have regular conferences, attended by field staff, and industry administration, research–extension liaison, and extension aspects are discussed. These conferences and meetings of staff are of necessity restricted in scope and frequency under the present set up. A valuable recent development has been the holding of sheep and wool 'refresher schools' in the eastern States. This year six Western Australian sheep and wool extension officers attended the latest course, and derived much benefit from it. Continuation of these courses and expansion to include other industries would be a valuable contribution to extension and it is considered that the training would be greatly improved by the following:

1. An examination of the need for basic training in extension at the university level either before or after graduation
2. Development of a defined programme of training within the Department with in-service training by specially equipped and designated officers
3. Increased supervision in the field by officers specially equipped to advise and assist with the forming of district programmes

SUMMARY

Historical and industry influences have largely created the present form of the Western Australian Department of Agriculture. It is evident that the delineation of our agricultural industries is into well defined climatic regions with very little overlapping of the boundaries of different activities. It is considered therefore that the present structure forms a suitable framework from which to serve our agricultural industries.

The deficiency of experienced graduate staff in the middle age group has been a factor limiting the Department's activities and the provision of a full and adequate extension service will be dependent upon a policy of continuous recruitment of staff at both graduate and technical levels. Emphasis is not placed at this stage upon the ultimate in extension — farm management and economic advice — but on the provision of an efficient technical service including well equipped district centres.

The desirability of improved training in extension and the inclusion of 'refresher' courses including extension methods is appreciated. However, it should be remembered that the provision of such a service will be ever dependent upon virile research and investigation by well qualified personnel.

To assist in the dissemination of technical information, an improved and enlarged publicity and information section is being developed.

PAPER 6

AGRICULTURAL EXTENSION SERVICES IN TASMANIA*

The Tasmanian Department of Agriculture embraces all fields of agricultural extension within this State. It handles soil conservation, carries out all the field work associated with rural finance, includes extension work to the Junior Farmers' Federation, and is responsible for the teaching of agriculture in schools controlled by the Education Department.

HISTORICAL BACKGROUND

In the mid 1920s Tasmania was concerned with her position as a result of Federation and sought aid from the Commonwealth Government. As a result, an investigation was made by the Development and Migration Commission under the chairmanship of Mr. H. W. Gepp (later Sir Herbert Gepp).

The Prime Minister then recommended to the State Premier that one of the greatest needs was to improve the agriculture of the State and the first method stated was by the extension of scientific knowledge among producers. This was adopted by the State Government, which agreed to the re-organization of the Department of Agriculture in 1927. In the financial year 1926/27 the estimated total cost of the Department was £19,512. The Department then consisted of a Director (appointed in 1926), three officers in the Farm Crops Division, a poultry supervisor, three officers in the Dairy Division, a horticulturist, veterinarian, agricultural economist, plant pathologist, clerical staff, staff assistants, and stock and port inspectors. The headquarters officers were divided between Hobart and Launceston.

The re-organization provided for the strengthening of both extension and technical services, and appointments were made to the positions of Superintendent of Extension Services and Superintendent of Research. This was the commencement of the organization of an Extension Service on a 'general-practitioner district-officer' basis in this State, when six 'agricultural organizers' were decentralized throughout the State. The recommendation of the Development and Migration Commission at that date was that the duties of this Service would be 'to transmit information from the experts at headquarters effectively to the farmers'.

The first development in the expansion of extension was from the mid 1930s, when the Dairy Division appointed qualified dairy officers to its field staff, with the object of gradually replacing men engaged solely in inspectorial work, both on the farm and in the factory. These officers worked in close liaison with the Extension Service, confining their activities mainly to improvement in the quality of dairy products. These changes did not produce the desired results immediately and it was not until after the cessation of the 1939–45 war that enlargement of staff commensurate with the technical requirements of the expanding dairy industry brought forth satisfactory improvements.

Originally the Animal Health Service staff consisted of qualified veterinary surgeons whose function was mainly disease control, comprising investigational and advisory work, together with the supervision of a lay stock inspectorial staff. During 1941 a Veterinary Nationalization Scheme was introduced which offered clinical services of a private practitionary nature to the farmers. In consequence less time was available for organized investigational work, but farm contact was automatically increased, which gave greater scope for advisory work. Following the 1958 Sutherland Report on the Brucellosis Eradication Scheme in which the Department was criticized 'for the lack of information given to farmers on the progress of the Scheme', a position of Veterinary Extension Officer was created and filled in November, 1959, by a veterinary graduate.

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* Prepared by the Tasmanian Department of Agriculture.

As time progressed the 'general-practitioner district officer' found more support necessary on technical matters in relation to sheep and wool production, as a result of which a sheep and wool officer was appointed in 1947. This officer, though working in close association with extension officers, was directly responsible to the head of the Department. This Section remained so responsible until 1954 when the Senior Sheep and Wool Officer resigned; he was not replaced until 1960. During the intervening period one or two sheep and wool officers were directly responsible to the Extension Service. This Section is now engaged partially on investigational work and partially on extension work in close association with the Extension Service.

As dairying expanded as part of the farm development programme pushed by the Extension Service, it was found desirable to give more technical assistance with the expansion of the associated pig industry. A Piggery Section was therefore formed in 1951 which functioned for two years with one officer. In 1953 a trained officer was appointed to supervise pig-raising investigations at the Cressy Research Farm. During 1954 the first regional Piggery Specialist Officer was appointed, since which date two more regional appointments have been made. The function of the regional officer is solely extension work, which is carried out in association with Extension Service officers in so far as group methods are concerned.

At establishment, the Horticultural Division had a small number of officers whose duties were partly inspectorial and who also engaged in extension activities. It has been built up fairly rapidly over recent years to the strength and structure described later.

Current Extension Structure

The Extension Service, under the direction of the Chief Extension Officer, is divided into three regions, each under the supervision of a Senior Agricultural Officer. Each region is further subdivided into districts (fourteen throughout the State). All districts are staffed with a District Agricultural Officer who is responsible to the Senior Agricultural Officer for the implementation of general extension work within his own territory. The majority of districts are also staffed with Agricultural Officers who are assistants to the District Agricultural Officers. Agricultural Teachers who teach in schools on an itinerant basis (covering 42 schools throughout the State) are also responsible to the Senior Agricultural Officers in whose region they reside. Junior Farmer activities are guided by a State Supervisor and an assistant who are directly responsible to the Chief Extension

Officer. The Extension Service also contains an Extension Aids Section and a Specialist Liaison Section which are detailed later.

Extension specialists are employed in the fields of horticulture, poultry, sheep and wool, pigs, animal health, and dairying. Horticulture, animal health, and dairy extension specialists are responsible to the Chiefs of their own Divisions. Poultry, sheep and wool, and pigs form separate sections which are controlled by senior officers who are responsible to the Director.

The Horticultural Division has research and extension sections directly responsible to the Chief Horticulturist. Its extension section is administered on a regional basis with the Senior Horticultural Officer in each of the regions (southern, northern, and north-western) supervising the activities of the District Horticultural Officers. A close link is maintained with the research section and with other Divisions as well as with C.S.I.R.O. and other State Departments of Agriculture. Farm management is an integral part of each horticultural extension officer's duties. With the challenge of increasing costs and lower returns per unit of production, the matter of management has received considerably more attention during recent years. This management includes the selection of suitable horticultural crops and rotation systems. Mass media, as described later, are used considerably, but individual contacts are probably the most freely and widely used means of contacting growers.

Specialist Divisions whose primary function is to carry out research and investigational work for dissemination by the Extension Service comprise agronomists, agricultural economists, bacteriologists, plant pathologists, and entomologists. The present trends are much in line with the original organization, namely, that a group of specialists on the one hand would carry out the necessary investigational work and the results would be passed over to extension officers for introduction to farm practice.

While this development has been taking place, the Extension Service has been given the added responsibility, commencing in 1935, of carrying out the whole of the field work required by the Agricultural Bank Department. This has necessitated a growing stress on farm economics and management which has resulted in extension officers requiring more assistance in specialist lines.

In the early days of the general practitioner, the general state of farming conditions was so backward that great strides in improvement could be made with the introduction of better practices such as the use of artificial fertilizers, the sowing of improved pastures, and the carrying of the resultant stock, and it was possible for the whole of this work to be carried out by general practitioners. As standards improved and more advanced techniques became known, it was found necessary for specialist extension to be introduced to ensure that the necessary advances in techniques were implemented and expanded at the same rate.

CURRENT STAFFING POSITION

Scientific Officers

With the exception noted below with regard to veterinary officers, the extension activities of this group are very limited and consist only of giving specialist information to extension personnel and occasional assistance by selected officers at field days. The veterinary officers in the field conduct a clinical veterinary service, in the course of which some extension is done. The quantity varies from officer to officer.

TABLE 1

SCIENTIFIC OFFICERS

Agronomists	14
Bacteriologists	4
Entomologists	3
Plant pathologists	4
Horticulturists	8
Biochemist	1
Parasitologist	1
Animal pathologists	3
Animal research officer	1
Chiefs of research Divisions	3
Veterinary officers	22
Economist	1
Deputy Chief of Division	1
Chiefs of Divisions — mixed functions	2
	68

The assessment of 'full-time equivalents' of 'Scientific Officers' in extension is made up as follows: 5 agronomists @ one-sixth; 3 entomologists @ one-eighth; 3 plant pathologists @ one-eighth; and 15 veterinary officers, etc., @ one-quarter to one-eighth. This gives a total of 5 full-time equivalents.

Extension Officers

Of the 74 officers listed in Table 2, 29 are full-time general practitioners and the

TABLE 2

EXTENSION OFFICERS

Division	Time on extension	Graduates	Diplomates	Other	Total
Extension Service	full	4	24*	1	29
Extension Service (Poultry)	full	—	3	1	4
Horticulture	full	1	8	2†	11
Horticulture	three-quarter	—	1	6‡	7
Dairy	three-quarter	—	11	1	12
Dairy	half	—	1	—	1
Sheep and Wool	three-quarter	1	3	1	5
Piggery	full	—	3	—	3
Piggery	half	—	1	—	1
Animal Health	full	1	—	—	1
Total		7	55	12	74

* Excludes two full-time Junior Farmer Club supervisers (diplomates), an Extension Aids officer (diplomate), two research farm managers (one graduate and one diplomate), and 11 agricultural teachers (one graduate and 10 diplomates) who instruct in schools.

† Includes one fruit packing instructor.

‡ Includes four fruit packing instructors.

others are specialists within the categories shown. The full-time equivalent of the 74 is 67.

Other Officers

Stock inspectors are mainly concerned with stock parasite control, chiefly in an inspectorial capacity. The same applies to vermin inspectors. They are not employed for extension purposes except in a very limited way. The 'technical' officers are used on work on field plots, in laboratories, and in such duties as taking specimens connected with stock disease control, etc., and do not perform any extension duties. They are mainly attached to research personnel. Port inspectors and herd recorders are also not used for extension purposes. The commercial artist is employed on publicity material and can therefore be regarded as mainly concerned with extension.

TABLE 3

OTHER OFFICERS

Stock inspectors	28
Vermin inspectors	19
'Technical' officers, Animal Health	13
'Technical' officers, all but one in research Divisions ..	19
Port inspectors	27
Herd recorders (permanent staff only)	4
Commercial artist	1
	111

To assess the extension equivalents of 'Other Officers', the following has been adopted: 47 stock and vermin inspectors @ one-fifth; 10 technical officers @ one-fifth; and 1 commercial artist; giving a total of 12 full-time equivalents.

'Full-time Equivalent' Ratios

There are thus 84 'full-time equivalent' extension officers in the Department, consisting of 5 'scientific' officers (specialist), 29 extension officers (general practitioner), 38 extension officers (specialist), and 12 'other' officers. The ratios of these 'full-time equivalent' extension officers to farm population, to rural properties, and to each 1,000 acres are shown in Table 4 (figures as at March 31, 1961).

TABLE 4

EXTENSION OFFICER RATIOS

	Ratio
Farm population 51,514	1 : 613 persons
No. rural properties 11,201	1 : 133 properties
Total rural area 6,510,646 ac. ..	1 : 77,508 acres

THE EXTENSION SERVICE

From the outset, Extension Service staff were decentralized. The original decentralization commenced with districts in the North West, North Midlands, North East, South East, and South. As greater activity took place among the farming community, expansion became necessary and districts were subdivided. There are now 14 main district offices with special horticultural staff located at three other centres.

Following this subdivision and soon after the absorption of work previously done by the staff of the Closer Settlement Board of the Agricultural Bank, it became necessary to adopt the regional system in 1937.

Under the regional system the respective senior officers (where there are sufficient officers in a Division to warrant it) control and supervise the activities of district personnel of their respective Divisions. Senior officers (Senior Agricultural Officers, Senior Horticultural Officers, and Senior Dairy Officers) are located at the headquarters of the region, i.e. Burnie for the North-West, Launceston for the North, and Hobart for the South, and so are in close contact with the extension staff within the region. With the exception that the Extension Service is generally responsible for office administration at decentralized offices, each Division largely conducts its own affairs. Despite this, there is considerable liaison, effected by senior officers between themselves usually, but sometimes on a State-wide basis when Chiefs of Divisions make special arrangements for a 'drive' on a particular subject covering the sphere of more than one Departmental Division or when farmers' schools are being held.

In matters of State-wide importance, coordination of extension activities within the Department is attained through Divisional Chiefs. In such cases where extension programme planning is required in connection with 'drives' on certain aspects of the work, this is inaugurated by the Chiefs of Divisions and subsequently planned for implementation in the field through the regional Senior Agricultural Officers. Broadly speaking when main lines of coordination have been provided by Chiefs of Divisions, coordination takes place in the field on a regional Senior Officer basis. The conduct of local field days, and attendance at farmers' meetings, is often arranged on a district level between officers of the various Divisions who are stationed at the same centre.

Research–Extension Liaison

The main method adopted for research–extension liaison is by the publication of an Extension Service Handbook (a specimen available at Conference for information). This is a loose-leaf book subdivided under subject headings containing the latest recommendations of all specialist Divisions which have been released for dissemination. The book is compiled and kept up to date by two officers of District Agricultural Officer rank who have had experience in the field. As recommendations become superseded, pages are exchanged in the Handbook. It is maintained for office use and in addition to detailed specialist recommendations contains references for further reading. In addition to this, a Field Handbook is also supplied to extension officers which can be carried with them daily and contains the type of information to which they may need to refer on the spot, such as spray mixtures, seeding rates, etc.

Research–extension liaison is carried out closely with specialist Divisions in relation to the extension of field trial work. All trial work is carried out by the specialist officer who is responsible for obtaining significant data and when the stage has been reached that it is necessary for this work to be transferred to the 'pilot' trial stage, the work is undertaken by extension officers in the field, who keep in close touch with the technical officers responsible. It is only when investigational work has passed this stage and it is undertaken on the basis of demonstrations that it is entirely carried out by the extension man in the field.

Farm Management Extension

Farm management extension in Tasmania comes under two headings: some is carried out on properties under the aegis of the Agricultural Bank, and some work is done on private properties. In the case of the former, the Closer Settlement Board and the Board of Management of the Agricultural Bank (both under the chairmanship of the Manager of the Agricultural Bank) do not make advances unless they have called for a report on the farming activities and economic use of such advances from the Department. When approving loans the Board concerned approves only advances for specific purposes and the work entailed is then, in the majority of cases, carried out under Extension Service supervision based on an approved plan of development. In some cases where farmers, for some reason or other, have come into arrears with their accounts these Boards request that they be taken over as 'planned' cases by Extension Service officers and under such headings the officers are responsible for the control of all receipts and expenditure in connection with the holding.

The demand for assistance with planned farming by private individuals has increased greatly of later years due no doubt to the decline in some commodity prices. The expansion of this work is causing concern in some areas as it is most time-consuming and detracts from the implementation of plans for the improvement of whole areas.

Extension Methods

Mass Media.—The Tasmanian Journal of Agriculture is published quarterly, and bulletins are prepared from time to time by extension Divisions. Local press assists, all statements being released from Head Office in the name of the Minister for Agriculture. The Department cooperates with the Australian Broadcasting Commission and supplies speakers fortnightly for the Country Hour session. These are divided between various specialist Divisions and the Extension Service. In addition, some local officers are authorized to make direct arrangements with local commercial stations for short sessions which deal solely with matters of production. There are no Departmental funds involved in the use of radio as a mass medium. Television has not yet extended beyond the Hobart viewing area and opportunities for agricultural extension by this method are not yet available, except to a limited extent covering home gardening in urban areas. Plans for providing coverage to country districts are being discussed, as two stations in the north will be operating soon.

Group Methods.—The following methods are widely employed and favourably received by the farming community: field days, drive-abouts (held on several neighbouring properties), talks at farmers' meetings, short courses for one or two days on special subjects, film evenings, and discussion groups. Considerable importance is given to this form of extension as it enables the widest possible contact to be made with the farming community on subjects of general interest. It is realized, however, that it has its limitations as it does little more than create interest and follow-up work is essential if action on the part of the farmer is to result.

Of particular value and worthy of special comment are the fruit-growers' 'get-togethers' held annually by horticultural extension officers just prior to the fruit export season. Here export requirements (including especially any new departures) are stressed and demonstrations given, and the minds of growers and workers in the industry are informed, refreshed, and often stimulated towards producing a better pack of apples and pears. These 'get-togethers' are much appreciated and attendances of up to 500 persons are obtained in the south, and up to 150 in the north. It is of interest to note that these attendances are obtained despite the fact that the gatherings are held for most of one day and almost all the activities take place during the daytime. A good midday luncheon is provided, usually by a commercial firm or firms.

Individual Advisory Work.—This is generally referred to as the best contact with farmers, but because it is so time-consuming it is difficult to expend a large proportion of a district officer's time in such work. If such work could be confined to obtaining action following interest aroused by group methods it would be well worthwhile. However, experience has shown that there are many farmers who make continual requests for advisory visits in relation to matters which they should be capable of handling themselves.

Library Facilities

There are two main libraries in the State, one in the south and the other in the north. All decentralized officers are regularly notified of available books which can be borrowed. Most district offices are equipped with small libraries which include a few reference books and current publications.

In-service Training

For many years past all officers of the Extension Service have met for one week annually at a residential conference. The nature of this conference varies from year to year in the amount of time spent on various subjects. It is estimated that, on the average, the time is utilized as follows:

1. Discussions with specialist officers	65%
2. Extension techniques, including administration in relation to these ..	35%

Commencing this year, this conference has been confined to Senior and District Agricultural Officers. Assistant officers will have a separate week devoted entirely to training in extension techniques.

Special Services

Junior Farmers.—The Junior Farmers' Federation commenced activity in Tasmania in 1950. Though originally sponsored by the Royal Agricultural Society and controlled by a council comprising mainly farmers and businessmen, Departmental officers took a major part in its establishment and subsequent expansion. At the present time, Junior Farmers comprise approximately 40% of the controlling council and the current State President is a former junior farmer. Two extension officers, the State supervisor, and an assistant now play an active part in extension through farm and home projects, contact with 'Divisional Councils' in their regions, courses in leadership, and general organization relating to citizen training. The Department assumes responsibility for the agricultural content of all club programmes and assists its implementation through extension officers.

Agriculture in Schools.—By arrangement with the Education Department the majority of agricultural teaching in High Schools and Area Schools is done by officers of the Extension Service. The Chief Extension Officer is Chief Examiner in Agriculture for the Schools Board Examination (1 year behind Matriculation) and all oral and practical examinations are carried out by extension officers.

Tasmania, therefore, has the standard of agricultural education, from boys of 12 years of age through Junior Farms to adult education, guided by the Extension Service.

PAPER 7

HISTORY AND DEVELOPMENT OF AGRICULTURAL EXTENSION IN THE TERRITORY OF PAPUA AND NEW GUINEA

By J. C. LAMROCK*

It is difficult to make the content of this paper one which depicts chronological history in detail, since the development of agricultural extension in the Territory has mainly been a recent one carried out only in the years following the Armistice of World War II. The content of the paper is aimed at describing the history of agricultural extension with the indigenous people. No reference is made to agricultural extension work carried out with the expatriate sector of the population. The only notable historical point in regard to expatriate agricultural extension is that two years ago the Territory witnessed the first private consultant service carrying out agricultural extension work in the main with expatriate planters. At the present time the private consultant service is staffed by two professional men who were formerly with the Administration of Papua and New Guinea Department of Agriculture, Stock and Fisheries.

HISTORICAL DEVELOPMENT

Further, the aim of the subject matter is to promote discussion as to what we can learn from history.

Territory of Papua and New Guinea

The island of New Guinea is the second largest island in the world. It is divided politically into three areas: West New Guinea, administered by the Netherlands Government; Papua; and Mandated Trust Territory of New Guinea. The last two politically defined areas include the off-shore Bismarck Archipelago, South East Archipelago, and Bougainville Island of the Solomons Group, administered by the Commonwealth Government of Australia.

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* Department of Agriculture, Stock and Fisheries, Konedobu, Territory of Papua and New Guinea.

Geographically, the Territory of Papua and New Guinea in the context of this paper is a land mass lying between 1° and 9° South of the equator, having a land area of about 183,000 square miles. Due to the geographical position, it follows that agricultural activities in the Territory follow a tropical pattern in the main. However, due to the topography of the country, a wide variation in microclimates is witnessed. The reasons why there is such a variation are, mainly, two basic factors: i.e. the topographical feature of the central mountain range system, the highest peak being 15,000 feet and the ranges having an average altitude of 9,000 feet; and the prevailing trade wind system, which results in variation of the seasonal rainfall pattern. In the vicinity of Port Moresby the average rainfall is 45 inches per annum, mainly falling in the so-called 'wet season', that is December to April, and 350 inches per annum is regularly distributed over the year at Gasmata in the New Britain District.

All factors with which the agricultural endeavours are faced, that is, climate, soil, rainfall, temperature, etc., have a great bearing upon the land capabilities and land utilization pattern in Territory agriculture. Besides these physical features controlling the Territory agricultural pattern, the question of population distribution has an overriding effect. The Territory's indigenous population at present is of the order of 1¾ million. Of these, 70% live in the mountain or highlands areas of the Territory. The reason for this preponderance of people in the mountain areas is the effects of climate and especially the effect upon the physical health of the population. This factor is in special reference to endemic diseases such as malaria. The heavy concentration of population in these areas is not the result of the inherent land capability being high. On the contrary, in certain densely populated areas of the Territory the land capability and land utilization by the people can be considered poor by any standard.

Before World War I

Prior to World War I, Papua was administered by the United Kingdom Government of those days and was known as British New Guinea. At the turn of the century, control of this territory was passed from the United Kingdom Government to the Queensland Government. A small sub-Department of Agriculture was formed having as its object the introduction of new species and varieties for trial purposes and to be, if found suitable, the basis for introduction of new primary industries. No agricultural extension was carried out as we know it today. The Trust Territory of New Guinea was administered by the German Government of that day. The administrative arrangement of that Government was the development of New Guinea by utilizing a company system which, in British history, has its counterpart to a certain extent in the East India Company. Agricultural development was aimed at the planting up on a large scale of the plantation crop, coconuts, in the more favoured areas. However, in both cases the main theme of the higher governmental executive policy was that the land in both territories was to be developed for the benefit of the indigenous people. The mechanics of implementation of this policy decision were many and varied and may be the subject of a historical study for those who are interested.

Before World War II

At the conclusion of hostilities in 1918, the administration of New Guinea came under the auspices of the League of Nations, in turn the Commonwealth Government of Australia receiving an Administrative Mandate for the Territory. During this period, i.e. the between-war years, the two territories were separate and basically autonomous. There were two administrations, and to proceed from one territory to the other one had to be in possession of a permit. There were two Departments of Agriculture, one in Papua and one in New Guinea. However, the executive policies for both territories had a common target in that each country's agriculture was to be developed, with the aim of improving the standard of living of the indigenous people. The prevailing world economic factors during this period retarded agricultural development in Papua. The Papuan basic industry, copra, was forced into a position where it was selling for less than the cost of production. In the Territory of New Guinea development was able to proceed at a greater rate because the Administration had the necessary finance from revenue obtained from gold royalties. During this period the New Guinea Administration was able to construct and operate three agricultural stations. These stations had the function of trial plant introduction and, to a limited extent, the training of indigenous people in improved agricultural practices.

Since World War II

The advent of World War II brought about the complete suspension of the civil agricultural endeavour. The Territory served, in the main, as a major battlefield for military ventures in the South-east Asian area. Both territories, for the most part, came under the control of Japanese military forces. During the ensuing battles the majority of normal civil facilities available to the country were destroyed or lost. The loss was reflected especially in manpower, there being only three pre-war agricultural officers available to assist in the reconstruction in the post-war period. The only decided advantage which the agricultural development of the Territory gained from World War II was the mental effect it had upon those indigenous people who were in close contact with the troops and military action. This mental effect on the people concerned made them realize that Papua and New Guinea was no longer an isolated country in world affairs, and this in turn made the people receptive to new ideas.

The present Territory Administration took over the normal governmental functions of the country from the New Guinea Administrative Unit (ANGAU) in 1946. Complete civil administration was formalized as late as 1952 by the Commonwealth Papua and New Guinea Act. The major advantages which the present Administration has as against the previous Territory's Administration is that both territories — Papua and New Guinea — are now administered as one unit. This development saw the initiation and development of the present Department of Agriculture, Stock and Fisheries. The post-war Department of Agriculture, Stock and Fisheries had as its initial task the rehabilitation of the agriculture of a war-shattered country. This task was quickly dealt with, since in many areas it was not possible, because of the ravages of war, to revitalize certain industries.

TABLE 1

PAPUA & NEW GUINEA PRODUCTION, TEN-YEAR PERIOD

	1950/51	1960/61	Estimated indigenous participation
Cocoa beans	317 tons	7,296 tons	28%
Coffee	32 tons	2,300 tons	31%
Copra	64,301 tons	103,000 tons	24%

The second task, which I think in the main is the only object of a normal Government Agricultural Department, is to promote the development and advancement of primary industry, and in so doing the rural people are to play an active part so that their standard of living may improve. In order to realize this last main object, the present Department has evolved into an organization which consists of four Divisions:

1. Plant Industry
2. Animal Industry
3. Fisheries
4. Extension and Marketing

AGRICULTURAL EXTENSION ACTIVITIES

The four Divisions are complementary to each other and are so integrated at the executive level in order that the national object may be realized as quickly as possible, keeping in mind the problem of efficiency. This factor of a coordinated and integrated Department of Agriculture is all-important in Territory agricultural extension. The reason for this is that the cadre of our extension officers are confronted with two basic problems on appointment to the Service. These problems do not normally confront their contemporaries in Australia. The first problem is professional knowledge dealing with tropical agriculture, having special application to Territory conditions. The second factor is the cultural habits of the indigenous population. The extension officer must be in a position where he can fall back on the Department for technical knowledge as and when required. The cultural differences in the population can only be covered adequately by on-the-spot in-service training under the supervision of experienced officers.

TABLE 2

DEPARTMENT OF AGRICULTURE, STOCK & FISHERIES
AGRICULTURAL EXTENSION STAFF

	1950/51	1960/61
Expatriate	28	116
Indigenous	78	437

From the foregoing it can be seen that history has given the Department of Agriculture, Stock and Fisheries an objective based on national or territory considerations. As mentioned previously, the first step to implementing such a policy is that all extension services must be coordinated efficiently with other sections or divisions of the Agricultural Department, as well as being coordinated in a like manner with other Departments which make up the central Government. Departments of particular reference in this regard in the Territory are those of Native Affairs, Education, Lands, Forests, and Trade and Industry.

History has shown us that the principal object which has to be effected by extension programmes is the changing, through modification, of the existing farming systems as practised. In a broad sense, the traditional agriculture as practised in the normal environment of the Territories peoples is the so-called system of shifting agriculture. This system is not efficient in terms of modern agriculture. It has been estimated that, as a Territory average, the traditional system requires approximately 20 acres of land to provide food, clothing, and shelter for a single family unit, the resultant standard of living not being very high compared with normal western standards. Recognition that the principal target for the agricultural extension programme is the modification of traditional farming systems has led us to the recognition of the key point of our extension programmes: that the Territory farming systems are based on land capability and not land utilization patterns. In modern agriculture, because of economic factors, the agricultural farming system is dependent upon land utilization. To clarify this concept the following example is given: in primitive agriculture the crops or husbandry practices carried out are governed by what the land will produce with the minimum of physical and mental effort — mental effort being in terms of farm management. In modern agriculture, by better land utilization, it is possible to carry out agricultural husbandry to grow agricultural products which would normally not be produced in that environment. To illustrate this point, ask yourselves what would be the Commonwealth wheat acreage if phosphatic fertilizers were not available to the present farming system.

The traditional farming systems for the Territory had as their objects the production of food, clothing, and shelter. As stated previously, the standard of supply obtained left much room for improvement. Recognizing this fact we in the Territory are confronted with two basic problems: firstly the improvement of subsistence agriculture, and secondly the introduction and improvement of cash farming systems. In Australia, I should say, your problem mainly concerns the cash factor. Having decided what improved farming system, i.e. subsistence or cash, is to be sponsored in an area, the programme must finally be evaluated in terms of acceptance by the people, since the introduced changes will definitely affect their traditional way of life on social, economic, and political counts. This change in the way of life may be termed 'the cost of progress'.

History has shown us that, in the implementation of a programme wherein the extension service's object in the field is the modification and, in some cases, the complete changing of the existing farming system, an extension officer must be fully conversant with the fundamental factors of land capability and land utilization as well as the governing factors of (a) land tenure, (b) rural finance and marketing,

(c) tropical agriculture (agronomic and animal husbandry practices), and (d) sociology, as well as the normal tools of the extension trade.

I now wish to describe to you the implications of some of these governing factors in agricultural extension programmes. It must be stated here that in the initial development of the post-war extension services we were not aware of these factors and to what extent they were important. However, history has shown us that these are the most important points and no extension programme can be carried out without due cognizance of them.

Land Tenure

In practice, the Territory agricultural extension programme aims at changing the traditional land tenure system, which is one of tribal ownership in which the family unit has usufructuary rights. The traditional system is quickly put to a severe test by the introduction of such permanent crops as coconuts, coffee, cocoa, and rubber. Thus the extension officer must have good lines of communication to the appropriate authorities on land tenure problems if a solution is not possible in the first instance. The Territory land tenure system, to say the least of it, is a complex one and in recent years administrative action has been taken by the central Government to rationalize the traditional system by initiating land settlement schemes. These schemes in their entirety are not a complete solution to our problem, but are a useful adjunct in specific areas. History has shown us that in such schemes the Agricultural Department's extension activities must be carefully coordinated with other central Government Departments, such as the Department of Native Affairs and Lands, if the schemes are to have any chance of success.

Rural Finance and Marketing

Rural financing and marketing is a function in which the Territory extension service has to take an active role, since such facilities as banks and companies connected with primary industry are not available in the Territory. The Extension Division carries out this function, from the stage of supplying hand tools to indigenous farmers on a cash and carry basis, to the purchase of crops. This financial arrangement may appear at first bureaucratic; however, this direct action is only in the first part of the rural finance and marketing problem.

The Agricultural Extension Service, in conjunction with the Department of Trade and Industry, organizes a group of farmers, when the situation warrants it, into a simple business organization which is basically a training ground in modern business practice, the future development being allowed to progress to either a private entrepreneur, company, or producer-cooperative type of organization depending upon the local circumstances. The organization, when under the control of the Agricultural Extension Service, has in the main a target of supplying some factor of agricultural production which is beyond the capabilities of the individual. An example is the organization venture of the capital purchase and operation of a rice mill for the benefit of the individual rice producer. Our foremost project of this nature at the present time is the Tolia Cocoa Project in the vicinity of Rabaul. This project has developed over the last decade; the traditional farming system has been modified to include a large content of cocoa cash cropping. This progressed to the stage where organized processing and marketing became necessary, and a scheme was evolved whereby the capitalization for centralized processing equipment was carried out on a Public Utility basis, utilizing one sector of the indigenous peoples' advancement, namely Territory Local Government Councils.

One factor which we have found to be a necessary function of an agricultural extension service when considering this factor of rural finance and marketing is the implementation of specific legislation to meet the requirements of the task in hand. Though the Extension Service is responsible for this function, special care must be taken that legislation enforcement is not the task of the professional extension officer, since the 'police' role will quickly sap the confidence of the people in the Extension Service and the individual extension officer will be suspect in the minds of the people.

There is a further financial stage to be developed within the Territory, and that is the question of rural credit since this factor plays an important part in the implementation of change to a farming system. The role which the Agricultural Extension Service is to take has not been defined as yet.

Agronomic and Animal Husbandry Practices

The next point in the changing of a farming system which we have found to be a difficult hurdle to surmount is technically what agronomic and/or animal husbandry practices to implement. It is an unfortunate fact that, though the major proportion of the world's population is found in the tropic zone, the quantity of technical knowledge available on the subject of tropical agriculture is disproportionate to that which is available to primary industry in the temperate zones. The Territory Agricultural Extension Service has been confronted with field technical problems to which there is no immediate solution and will be solved only in the future. The point I wish to make is that history has shown us that the Agricultural Extension Service is only as good as the research facilities available to it, research in this sense being applied, not academic. We have, as in the case of other tropical countries, developed lines of communication regarding technical problems on an international basis.

The history of our development has shown us that, on technical grounds, an Extension Service cannot afford to be parsimonious in the training of professional agricultural officers. We have developed a training scheme wherein officers receive postgraduate and special project training outside the Territory as and when required.

Sociology

The final point I wish to bring to your notice regarding agricultural extension is the social content. I will not dwell on this point to a great extent, since our problem is complex, to say the least. The Territory's rural population is tribal, having approximately 500 recognized individual languages and a similar number of differing cultures. In their natural environment the people are superstitious and warlike in many cases; and, because of the country's topography, this insularity of the rural population is assisted by the lack of normally accepted communication facilities. The introduction of such agricultural extension organizations as agricultural bureaux on a Territory-wide basis is difficult. The main principle we have discovered is that whatever action you carry out the people's cultural pattern is surprisingly adaptable if the individuals can see ultimate gain in their general welfare.

You may well ask how we implement the previously mentioned basic principles in practice. We have found that personal agricultural extension contact at the village level is the most successful. But the logistic problem of the ratio of rural population to the staff and resources available has necessitated a technique of mass education in recent years whereby interested adult individuals, no matter what age and literacy standard, are taken into Agricultural Extension Stations and undertake practical training in improved agricultural practices in the widest sense. The trainee, or advanced farmer, at the conclusion of training and on return to his village, is aided in improving his traditional farming system on an area project basis by the supervising professional extension officer, assisted by his indigenous staff.

Conclusion

To sum up, I have given a very brief description of the Territory agricultural development, pointing out that Territory agricultural extension has really developed only since World War II, and that the history of such development is dependent upon an object being set for the Agricultural Extension Service. This definition of agricultural extension object is a direct result of a political decision. To achieve the defined object, if it is one of improving the material welfare of the rural population on a national basis, then that Extension Service must be coordinated and integrated with other administration and technical agencies having good lines of communication.

Territory agricultural extension practices have been aimed at the changing by modification of existing farming systems, and in so doing agricultural practices are widened from a land capability to a land utilization basis, taking due regard of the factors of land tenure, rural finance and marketing, plant and animal husbandry practices, and the social make up of the people concerned.

Finally, history has shown us that, in the development of such an agricultural extension approach, progress is dependent upon the availability of well trained extension officers.

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Paper 8

AGRICULTURAL AND PASTORAL EXTENSION SERVICES IN THE NORTHERN TERRITORY

By W. M. Curteis and G. A. Letts*

Agricultural extension in the Northern Territory could be said to have commenced in about 1880 with the then Curator of the Palmerston Botanic Gardens, Maurice Holtze, who advised on the sugar plantations growing at Delissaville, Beatrice Hill, and Shoal Bay and on the coffee plantations at Rum Jungle. Both Maurice Holtze and his son Nicholas were mainly interested in undertaking experimental work at the Botanic Gardens, but they carried out extensive trips exploring the prospects for development and advising the very few farmers on these prospects and on the results of their experimental work.

Historical Development

Agriculture

In 1912, just after the take-over of the Northern Territory by the Commonwealth Government, a Director of Agriculture was appointed to the Northern Territory and demonstration farms were established on the Daly River, at Batchelor, and at Mataranka. However, these farms were only short-lived, and a failure, and had practically no effect on agricultural knowledge in the Northern Territory or in helping the farmers in their problems.

It was not until about 1950, with the appointment of the Agricultural Officer in the Lands Branch of the Northern Territory Administration, that any real effort was made in connection with extension work for the existing farmers in the Territory. At this time there were about 600 acres of peanuts grown annually, mainly on the Katherine River and Daly River levee soils, and very small vegetable-growing communities in Darwin and Alice Springs. This was all the agricultural development that was being undertaken at the time, as no experimental work had been done on pasture and fodder crops for the pastoralists, and there was no dairying established in the Territory.

In June, 1955, a separate Agricultural Branch was established in the Northern Territory Administration, with the appointment of the present Director of Agriculture. The function of this Branch is the development of agriculture including both research and extension work necessary for the development of agricultural pursuits in the Northern Territory. With the establishment of a separate Branch, three extension officers were appointed: one at Katherine, dealing with vegetable, peanut, and fodder crops; one at Darwin, engaged mainly on vegetable and fruit production; and the third also at Katherine, working solely on pastures on pastoral properties throughout the Territory. The only additions to this staffing position have been a senior extension officer appointed in 1960 to supervise and direct the extension activities of the Branch, and a district agronomist to do extension and experimental work at Alice Springs. There is now provision in the organization of the Branch for an additional officer to do pasture work, mainly on pastoral properties in the Barkly Tablelands. All these officers devote a large percentage of their time to experimental work as distinct from purely extension activities because it is essential that information be obtained to supply the knowledge required in extension activities.

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* Northern Territory Administration, Darwin.

Pastoral Industry

Before World War II there were small Lands and Stock branches in the Northern Territory Service, but the staff employed was insufficient for any worthwhile research or advisory service. For example there was one Veterinary Stock Inspector, Captain F. Bishop, in the Territory between about 1925 and 1938, and much of his work was disease control carried out through horseback patrols. During the war, a number of veterinarians served in the Northern Territory on duties connected with meat preparation for the Armed Services, but up until 1946 one could say that there was no deliberate attempt to create an organization with extension functions or to apply extension methods to increase pastoral production. Probably this helps to account for the backward state of the industry to the present day.

With the appointment of a Chief Veterinary Officer in 1946, and the establishment of an Animal Industry Branch, an organization with trained field staff was brought into being. The head of the organization (then called Chief Veterinary Officer, now Director of Animal Industry) was a man who had served for a number of years as a District Veterinary Officer in the New South Wales Department of Agriculture, and consequently had an appreciation of the type of advisory service which had evolved in the States, and the role such a service could play in increasing production. However, the top-priority duties of the Branch in those days were to provide better facilities for travelling stock to enable a better percentage cattle turnoff to be achieved, and to do something about bringing diseases, which had been left unchecked for many years, under control. In other words, with the industry in its backward state it was fundamentally limited by difficulties of communications, lack of markets, and trade restrictions because of disease, rather than other factors affecting production which are more susceptible to solution by research and extension treatment.

The other factor limiting the establishment of a planned livestock extension service in the 1940s and 1950s was the lack of research on animals in the Territory and the lack of scientific knowledge which could be applied under our conditions. It is natural, in the circumstances, that the organization which developed should have a strong bias towards the regulatory side and that the key officers in the organization were Stock Inspectors. As the Branch grew, many of the Stock Inspectors were located in outlying districts throughout the Territory. While their functions were mainly regulation of travelling stock and disease control, their day-to-day contact with pastoralists and their training enabled them on many occasions to give advice, to influence attitudes, or to put the pastoralists in contact with other specialist officers who could assist them with problems. Through this field advisory service, many stations have been induced to adopt widespread vaccination against diseases such as botulism and pleuropneumonia in recent years.

CURRENT STRUCTURE, TRENDS, AND DEVELOPMENTS

Agriculture

The present establishment of the Agricultural Branch is 50, including a Director, Assistant Director, five administrative staff, nine scientific staff, a market manager, an agricultural economist, and a machinery officer. The balance are working mainly on experimental work, with five personnel working on extension.

The basic qualification for all scientific officers, agronomists, and extension workers is a degree in agricultural science or science, and for technical officers a diploma in agriculture from a recognized Agricultural College. All members of the Agricultural Branch, with the exception of the machinery officer, market manager, one extension officer, and an acting manager of one of the experiment farms, have all the required academic qualifications.

With distances of 1,000 miles from north to south and 500 miles from east to west in the Territory, it is desirable to have decentralization of the agricultural extension staff, but this decentralization has to be confined to towns where there are some amenities for an officer and his family. For this reason the extension officers are stationed in Darwin, Katherine (220 miles south of Darwin), Tennant Creek (643 miles south of Darwin), and Alice Springs (956 miles south of Darwin) — all on the main highway between Darwin and Alice Springs. There are no other towns with a population of over 500 people.

The extension field staff is supervised by the senior agricultural extension officer, who is stationed in Darwin. There is very close coordination between the extension activities and the other work being undertaken by the Agricultural Branch, particularly as the extension officer has to rely so much on current experimental work for most of his extension information. The trials undertaken by extension officers on both farmers' and pastoralists' properties are drawn up in collaboration with the senior agronomist of the Branch and he is responsible for the final recording of data from the trials and the statistical analysis, if the trials are designed for such analysis. The trials are designed also to form a good extension medium. The extension officers have close coordination with the experiment farms and it is the responsibility of the senior extension officer to keep the extension officers informed of all developments within the Branch, and from other sources, that may be of assistance to them in their work.

There is a lack of information available to producers because of shortages of staff and funds for publication of findings of the work done on the experiment farms and by other sections of the Agricultural Branch. There is a need for an agricultural gazette and bulletin in which a lot of this information could be published. The Agricultural Branch prepares a comprehensive Annual Report, giving details of work done, but this cannot include full details of all experimental work undertaken; it is only roneoed, and has a very limited circulation.

Pastoral Industry

The Branch, in 1962, includes an establishment of 10 veterinarians, 5 science graduates, 1 agricultural science graduate and 2 animal husbandry graduates. In addition, there are 22 trained laymen who form the stock inspection team together with 2 positions of Supervisors (Experimental Animals). With clerical personnel, laboratory staff, etc., the total establishment of the Branch has now reached 82 positions, of which 70 are filled at this time. There has been for some years an acute shortage of veterinarians.

None of these officers has a purely extension function, although within the Branch's directive from the Administrator the pastoral extension function is clearly expressed. The responsibility for supervising extension work within the Branch lies with the Assistant Director, who is a veterinarian. Although no single officer has a full-time extension job, all the scientific and trained lay staff undertake some extension work. The percentage of time spent on extension work would in no case be above 25%.

Because the pastoral industry needs a readily available, mobile supervisory and aid service, the Animal Industry Branch has practised decentralization of field staff to a great extent. For example, during 1962, fifteen of the stock inspection staff will be living in remote parts of the four pastoral districts of the Territory; the balance will be divided between the two principal towns — Darwin and Alice Springs. These men are regularly supervised by veterinary staff who visit the remote centres at approximately eight-week intervals, and all Stock Inspectors are called together twice a year for a central conference which runs over two days.

COORDINATION AND LIAISON

Agriculture

The C.S.I.R.O. Land Research and Regional Survey Division is doing research work within the Territory and information is available from their specialized reports. This work is of a more specialized and fundamental research nature than would be usual in a State Department of Agriculture. The Administration has to fill the gap between this research work and the rural property owner and also to provide information on aspects of the work not covered by the C.S.I.R.O. research programme.

Pastoral Industry

Within the Territory there is room for more planning and coordination of extension activities. Work programmes are drawn up individually by Lands, Agriculture, Animal Industry, and Water Resources Branches, all of whom have an opportunity for carrying out some extension work. Because all these Branches are guided by the same Departmental policy, their press and radio work is directed towards the same ends, but there have been few combined extension campaigns involving field staff of two or more Branches. (The demonstration pasture plots on top-end cattle stations was an example of a cooperative scheme where the planning was carried out by a sub-committee of Agriculture and Animal Industry Branches.) Independently, Animal Industry field officers may and do consult the C.S.I.R.O. research team on aspects of research linked to the work of the Branch.

Although there has not been a coordinating force in the form of a central information section, a Publicity Officer recently appointed is assisting with the preparation of press and radio releases.

EXTENSION METHODS

Agriculture

Some recent developments in the use of mass media are as follows:

1. Radio.—Soon after Darwin Broadcasters Ltd. commenced transmission from Darwin, the Agricultural Branch established a weekly ten-minute session for rural people — called 'Territory Rural Digest'. The programme was first broadcast on 8th February, 1961, and was continued each week. The broadcasting time was provided free of charge, and the undertaking given that no commercial announcements would appear in connection with the session. Talks and interviews are also contributed by officers of the Animal Industry and Water Resources Branches and selected private citizens.

In addition to this regular programme, every assistance was given to the newly appointed A.B.C. Rural Officer. This included arranging for him to accompany extension officers on field trips, establishing contacts, etc.

The extension officers stationed at Katherine and Alice Springs are equipped with portable radio transceivers, by means of which they keep in regular contact with cattle stations to obtain information on seasonal conditions and progress of trials and demonstrations, and to give extension advice.

2. Press Publications.—Numerous articles and news items of an extension nature have been issued to the local press, and some extension information on insect pests and other subjects was prepared and duplicated for general distribution.

3. Meetings and Field Days.—Apart from the annual field days held on each of the experiment farms, field days have been held on private properties in cooperation with farmers' organizations. Also, with the object of encouraging a wider general interest in Northern Territory agriculture and its development, a series of film evenings in conjunction with the North Australian Show Society was arranged. Two such meetings were held at the Winnellie Showgrounds during the latter part of the year and the attendance surpassed all expectations, ranging from 120 to 140 persons per evening. The programme of these evenings included selected films and illustrated talks by Branch officers.

During field trips, extension officers take every opportunity to hold evening meetings, show slides, and discuss general problems. Audiences at these meetings have ranged from two to thirty, and they have proved a valuable extension medium in these remote areas.

4. Show Exhibits.—The value of show exhibits as an extension medium must be given a low rating, as far as the primary producer is concerned; however, they are valuable in the field of public relations, showing the public the scope and value of the Branch's work, encouraging the interest of school children, and attempting to establish a general public faith in the future of Northern Territory agriculture through scientific research and extension. Comprehensive Branch displays were prepared at both the Alice Springs and Darwin Shows, and the Darwin exhibit won first prize in the competition between the various Government Departments and Administration Branches. Agricultural Branch officers have also been active in the preparation of exhibit material, organization of staffing arrangements, and other matters for the Administration's displays at the various capital city Shows.

5. Farmers' Organizations.—The policy of the Branch is that active farmers' organizations serve a very useful purpose in the development of agricultural industries and provide an excellent means of disseminating extension material by mass media techniques. In view of this, every effort has been made to encourage the establishment and guide the progress of such groups.

There are at present four farmers' organizations in the Northern Territory — situated at Darwin, Adelaide River, Katherine, and Alice Springs. The Katherine group has been operating successfully for several years and in the past twelve months has achieved notable progress by cooperative action on packing, marketing, and price control of fruit and vegetables. The Darwin group was formed at the beginning of the year. Early progress was good, but interest has waned in recent months. The Batchelor/Adelaide River Primary Producers' Association was formed at Adelaide River on the 20th March, 1961, and has been most active in many aspects of agricultural development in the area. The Alice Springs Farmers' Association was formed in November, 1960, and has since held regular monthly meetings at which attendances have varied from 12 to 32 persons.

At the present time there are no specialized extension activities for junior farmers or for women, although extension officers often give talks to branches of the Country Women's Association in the Territory and the women take an active interest in the visits of extension officers, particularly in connection with the growing of vegetables and general home gardening.

Pastoral Industry

1. Mass Media.—With the limited staff available and vast distances to cover, mass media will continue to play an important role in the Territory for many years. The Branch has featured poster messages on its Droving Programme which goes to all northern pastoralists and drovers; over twenty leaflets have been prepared on a variety of practical subjects; regular press and radio releases are made; and modest exhibits arranged at the Alice Springs and Darwin Shows.

2. Group Media.—Field days have been used to a limited extent at the Alice Springs Research Institute.

The Branch assisted in the formation and development of the Cattleman's Association of North Australia, whose aims include cooperation with government scientific bodies.

An approach has been received from a group of stations in the Victoria River district to run a school for pastoralists in 1962, and it is felt that such schools might have a very useful place in future extension work.

3. Individual Work.—Station visits are made by stock inspectors, veterinary officers, and specialists such as the botanist or field biologist. The officer is usually called out to an emergency, e.g. stock losses, and the opportunity often occurs for discussions and demonstrations on other matters of interest. We have been associated with on-station method and result demonstrations, e.g. phosphorus supplementation at Rockhampton Downs and Wave Hill.

Until now the greatest use has been made of individual contacts and mass media, with only a small proportion of extension effort devoted to group contacts.

SUBJECT-MATTER INTEGRATION, TRAINING, AND LIBRARY

Agriculture

The Agricultural Branch has a limited technical library, but at present no expert staff is available for the care of the library and the circulation of books, so extension workers are not fully informed of recent developments both inside Australia and overseas on their particular fields of work. Periodicals are circulated to all interested officers in the Branch within the limits of diversification of interests and funds. Much useful information is obtained by extension officers from the agricultural journals, particularly those from Queensland, and from the rural newspapers from that State, as a lot of work done in tropical Queensland can be applied to the northern part of the Territory.

Pastoral Industry

Scientific section heads in the Animal Industry and other Branches attend Scientific Liaison Conferences held biennially, when recent research findings are discussed. Every two years the Branch runs Stock Inspectors' Schools. These last for three weeks and are mainly subject-matter schools on topics such as animal husbandry, animal diseases, wildlife, organization, and method. The scientific staff prepare a standardized set of notes giving a wide coverage, and deliver the lectures or demonstrations. These schools are an excellent subject-matter refresher course for all staff, and the notes provide a subject-matter reference over the ensuing two-year period. At the last three schools a two-hour talk and discussion on extension principles and method has been included for the stock inspectors. Only one officer in the Branch has attended an Extension Principles and Methods School, of the type now being run annually by most State Departments.

The Branch has an extensive library in Alice Springs with a qualified librarian, and stock inspectors are on the mailing list for rural publications and scientific literature. In addition, the Branch issues short technical bulletins as necessary to keep the field staff up to date, and to standardize advice given in different districts.

Agencies, other than Northern Territory Administration Technical Branches, which independently exercise some extension functions on the pastoral industry are the A.B.C. Rural Section, commercial radio, local newspapers, private veterinarians, and Show societies.

PAPER 9

COMMONWEALTH FINANCIAL ASSISTANCE FOR STATE EXTENSION SERVICES*

SUMMARY

Under the Constitution, the responsibility for agricultural and pastoral production rests with the States. However, in 1948, the Commonwealth commenced to con-

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* Prepared by the Department of Primary Industry, Canberra, A.C.T.

tribute to the extension services of the State Departments of Agriculture in the form of the Commonwealth Dairy Industry Extension Grant, which has continued at the level of £250,000 per year. In 1952 the Commonwealth Government, recognizing the need to step up production, particularly of those products that were most important in earning foreign exchange, introduced the Commonwealth Extension Services Grant, which has fluctuated since then between £200,000 and £300,000 per annum. Since 1955, joint Commonwealth–industry research and extension schemes have been established under legislation and funds from some of these sources have been used for assisting extension services directly and for the conduct of applied research projects.

INTRODUCTION

Under the Constitution, the responsibility for agricultural production rests with the States. However, since 1948, the Commonwealth Government has played an increasing part in assisting the existing extension services:

1. by the provision of additional finance to the State Departments of Agriculture
2. by meeting the cost of projects that apply throughout Australia as opposed to those of significance to individual States only

This assistance has been provided directly to the individual State Departments of Agriculture under the Commonwealth Dairy Industry Extension Grant and the Commonwealth Extension Services Grant, which are described below. Under these Grants, each State Department of Agriculture submits a list of projects each year for approval by the Minister for Primary Industry. The moneys are made available on the understanding that the projects so financed are additional to the work already supported by the State Government.

The other means whereby assistance has been provided for the extension services is through allocations under some of the joint Commonwealth–industry research programmes. In these cases, of course, the contribution from the Commonwealth has only formed part of the particular allocation, the proportion varying according to the basis on which the finance for each individual scheme is determined under the legislation.

COMMONWEALTH–DAIRY INDUSTRY EXTENSION GRANT

This Grant was announced by the then Prime Minister on October 13th, 1947, at the time of the report of the Production Costs Advisory Committee on the dairy industry. It was recognized that there were at that time large numbers of persons in the industry who were not obtaining, per man employed and per cow possessed, the output that was feasible. The Government's object was to stimulate dairy production by the implementation of methods designed to assist dairy farmers generally in obtaining this output.

The Grant came into effect in 1948/49 for a period of five years and was extended for further five-year periods in 1953 and 1958, the annual amount throughout being £250,000, which is currently allocated as shown in Table 1. The projects conducted by the States under this grant include herd recording, infertility surveys, milking machine efficiency surveys, bull proving schemes, publicity and printing of pamphlets, brochures, etc., farm demonstrations covering all phases of fodder conservation, pastures, cropping, weed control, etc. Finance is also provided for additional extension officers and for interstate and overseas visits by State officers. (Ten overseas visits have so far been financed from these funds.)

TABLE 1

New South Wales	£64,880
Victoria	64,880
Queensland	65,840
South Australia	18,360
Western Australia	17,400
Tasmania	8,640
Commonwealth	10,000
	£250,000

The major projects financed from the £10,000 retained by the Commonwealth are the printing and reprinting of the various State editions of 'Dairy Farming in Australia' and the purchase of extension films from overseas. Films have also been produced in cooperation with various State Departments of Agriculture and have included 'It's In Your Hands', 'Maintenance of the Cream Separator', 'Grade Herd Recording', and 'Infertility in Dairy Cattle'.

COMMONWEALTH EXTENSION SERVICES GRANT

In April, 1952, the Australian Agricultural Council gave detailed consideration to the need for general agricultural expansion, and agreed to the adoption and publication of five-year production targets covering all the major export industries except the horticultural group (1). The Council considered that, if these targets were to be achieved, it would be essential to expand considerably the extension services of the States. At the same meeting the Australian Agricultural Council carried a motion in which it recognized the share of the Commonwealth and the States in the responsibility for increased primary production.

The Commonwealth Extension Services Grant was therefore established in 1952, its purpose being to enable the States to expand their existing agricultural extension services and to undertake new extension programmes which would otherwise not be possible without this financial assistance. While increasing competition in overseas markets has shifted the emphasis in agricultural production from increased output *per se* to greater efficiency and higher product quality, the improvements aimed at under the Grant are still relevant in these changed circumstances.

In the first year of the Grant, the amount made available was £200,000. This was increased to £300,000 in 1953/54, and remained at that level until 1956/57, when it was reduced to £250,000. This lower level was maintained until the end of the financial year 1959/60. By that time, continuation of the Grant had been approved for a further five years, commencing on July 1st, 1960, at a level of £300,000 per annum. The annual allocations at present for this Grant are shown in Table 2. The funds provided to the States under the Grant are utilized for a wide range of projects, some examples being:

1. Scholarships and cadetships for the training of extension officers at universities and agricultural colleges
2. Salaries of additional extension officers
3. Provision of extension aids such as cameras, films, and slide projectors
4. Publicity material, including bulletins, pamphlets, etc.
5. Contributions to the Poultry Improvement Plan
6. Farm demonstrations covering all aspects of production other than dairying and wool production
7. Finance for interstate and overseas visits by State officers (including 25 overseas visits to date)

TABLE 2

New South Wales	£75,000
Victoria	60,000
Queensland	57,000
South Australia	27,000
Western Australia	27,000
Tasmania	18,000
Commonwealth	36,000
	£300,000

A major item financed from the £36,000 retained by the Commonwealth each year is the provision of the Australian Agricultural Council Scholarships. These scholarships were first made available by the Commonwealth Government in 1956, at the request of the Australian Agricultural Council, to encourage outstanding students to undertake degree courses in agricultural or rural science at Australian universities. Twelve scholarships, two in each State, are made available annually. In 1960, the scholarships were extended to cover courses in veterinary science, agricultural engineering, and agricultural economics and, in 1961, approval was given for women to be eligible to apply. The scholarships may be extended to cover an honours year in cases where the student has achieved an outstanding academic record at the university. An indication of the success of the scholarships in attracting students of high calibre is given by the fact that, of the students who passed their final year in 1961, seven will be proceeding to an honours year or a higher degree.

Other items financed from the Commonwealth portion of the Grant include the purchase of films for extension use in all States, overseas travel by officers to undertake study courses and attend extension conferences, etc. Finance has also been provided for projects such as the water harvesting demonstrations conducted by the University of Sydney at Badgery's Creek, for specialist schools for extension officers, and for the production of films in conjunction with State Departments of Agriculture and other appropriate bodies. Such films include:

'Winter Pastures for Profit'
'Blue Mould of Tobacco'
'Their Health is our Wealth'
'Unending Search'
'Farm Machinery Maintenance'

Of particular interest to extension specialists are the sociological and extension methods surveys, which have been conducted by universities using Grant funds. The first of these was an investigation by the University of Sydney into social factors affecting serrated tussock control (2). The report of this investigation, published in 1958, traces the pattern of response of farmers in different age groups and management categories to infestation of their property by the tussock. In 1955, the Commonwealth agreed to the provision of finance to assist the University of Melbourne to conduct a sociological survey in the Bairnsdale area with the full cooperation of the Victorian Department of Agriculture. The emphasis in this survey was on the study of the psychological determinants of change in farming techniques and the acceptance of extension advice. The report of this survey was published in 1958 (3). These surveys have been particularly valuable for the light they have thrown on the reactions of the farming community to various extension techniques. The Victorian Department of Agriculture has been impressed with the results of these surveys and has since extended the surveys on its own initiative to a number of other districts. Comparisons of the results of successive surveys along these lines will delineate, with increasing clarity, general farmer reactions to the particular problems under investigation and will provide valuable leads for use in the training of extension personnel.

The Commonwealth also provided finance, in 1957, to enable the University of Sydney to conduct a survey of the Agricultural Bureau of New South Wales. The aim of this survey was to study the factors conducive to the Bureau performing an effective role in extension, together with those factors reducing its effectiveness and, in some cases, causing branches to close down. This survey has been completed and it is expected that the report will be available, in printed form, in the near future.

Finance has also been provided from the Grant, on occasion, to enable overseas experts to demonstrate in Australia to extension workers the latest methods in their respective fields.

Meanwhile contributions to other joint research programmes of a relatively small or short-term nature have been financed from an amount of up to £50,000 per annum made available on a matching basis in conjunction with the Commonwealth Extension Services Grant. These latter programmes include research into barley, peanuts, can mechanization, fruit-fly sterilization and commodity treatment, brown rot, diseases of stone fruit, and spray residues on fruit.

JOINT COMMONWEALTH–INDUSTRY RESEARCH SCHEMES

Until June 30th, 1960, Commonwealth contributions to these joint research schemes were obtained from the Commonwealth Extension Services Grant except in the case of the programmes for wool and tobacco, which were financed differently and are described briefly later in this paper.

The research schemes for the wheat, dairy cattle, and beef research programmes were financed from the amount remaining from £500,000 after the amounts for the Commonwealth Extension Services Grant proper had been deducted. However, as from July 1st, 1960, Commonwealth contributions to these research programmes have been financed from separate appropriations, administered by the Department of Primary Industry under Acts of Parliament.

It is of interest to note that, in the legislation for the Joint Commonwealth–Industry research schemes for wool, wheat, dairy, tobacco, cattle, and beef, the purposes in respect of which expenditure may be approved from the Trust Account include the application of the results of research carried out with moneys made available by the appropriate research committee after approval has been obtained from the Minister for Primary Industry. It is evident therefore that these schemes can play an important part in assisting the extension services in Australia and that they were not intended to provide funds entirely for research purposes.

Wool Research

Prior to the passing of the Wool Research Act in 1957, wool research had been financed from the Wool Research Trust Account, established under the Wool Use Promotion Act, 1945, and financed by contributions from consolidated revenue at the rate of 2/- per bale of wool shorn each year. The Wool Research Trust Account was established by the Commonwealth to enable the C.S.I.R. and the Department of Commerce and Agriculture (as these Departments were called in those days) to step up the very small amount of research in connection with the sheep and wool industry then in progress. The latter Department had the responsibility of initiating Commonwealth and State cooperation in extension work to ensure that the results of research were applied.

Under the Wool Research Act, 1957, funds are provided by woolgrowers through a levy of 2/- per bale and supplemented by a Commonwealth contribution of 4/- per bale. These funds are used, in the main, for wool research, but some finance is specifically made available to the State Departments of Agriculture for the employment of additional sheep and wool extension officers. In an effort to assist the States to keep the members of the sheep and wool branches of their Departments up to date, special refresher schools are also financed from the Wool Research Trust Fund at intervals of from 2 to 3 years. Postgraduate courses for selected State Departmental officers have also been financed from this source.

Most of the moneys made available to State Departments have been utilized for applied research projects. These have been very useful, not only for the value of the research itself, but also for the stimulation in interest of the officers responsible for carrying out the work and in the opportunities provided in the conduct of the research for them to make contact with woolgrowers, some of whom, otherwise, would not have asked the officers to visit their properties. Contacts made in this way have been continued when the particular research projects have been concluded.

Tobacco Research

The Tobacco Industry Act, 1955, established the Tobacco Industry Trust Account, into which are paid all moneys which become available for research and extension in the tobacco industry. Under the Tobacco Charges Act, tobacco growers are levied ½d. per lb on all tobacco sold to a manufacturer and manufacturers are levied 1d. per lb on all Australian-grown leaf bought for manufacture. The

Commonwealth contribution is not specified in the legislation, but amounts to £10,500 per annum. A further £15,000 per annum is paid by the Commonwealth under the Tobacco Leaf Production Grant. State Governments contribute £15,000 per annum also under the Tobacco Leaf Production Grant and C.S.I.R.O. provides £10,500 per annum. While funds from the Account are devoted mainly to research, considerable finance is also made available to State Departments of Agriculture for the employment of tobacco extension officers, for scholarships in agricultural science to train additional staff, and, through grants, to send Australian tobacco officers overseas to enable them to study particular phases of the industry in selected localities.

Conclusion

From the foregoing account, which, of necessity, has had to be brief, it will be apparent that the Commonwealth is providing finance to the State Departments of Agriculture to the extent of £550,000 per annum for agricultural extension itself and that considerable sums are made available for applied research projects through various channels.

It is considered that the assistance to the extension services that has been provided by the various methods mentioned above has played some part in the steady increase in efficiency of primary production in Australia since World War II.

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Paper 10

C.S.I.R.O. AGRICULTURAL RESEARCH LIAISON SECTION*

Origin and Purposes

On the 31st August, 1950, the Chairman of C.S.I.R.O. wrote to each of the State Directors of Agriculture informing them of the decision to establish a 'Research–Extension Liaison Unit' in C.S.I.R.O. He stated the functions of the proposed group to be:

1. To establish closer liaison between C.S.I.R.O. Research Services and State Extension Services by whatever means may be mutually agreed upon.
2. In association with State Departments, to provide for the preparation and dissemination of research results of C.S.I.R.O. in the most suitable form for use by extension officers of State Departments of Agriculture.
3. To arrange for the holding of short or long term extension schools or training courses in those fields in which C.S.I.R.O. workers have made significant extensions to knowledge or in those fields of biological science in which general advances in knowledge make it desirable to review their application to problems of the agricultural industries.

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* Prepared by the Agricultural Research Liaison Section, C.S.I.R.O.

4. To consider such other means for the improvement of a research and extension liaison as may be suggested at any time by State Departments of Agriculture.

The importance of cooperation with State extension services is stressed in the C.S.I.R.O. Head Office Circular 51/36 of 29th May, 1951, to all C.S.I.R.O. Divisional Chiefs advising of the establishment of the Agricultural Research Liaison Section:

> The object of the Section is to ensure as far as possible that the results of C.S.I.R.O. research are applied in agriculture. It will work mainly by extending and strengthening cooperation with State Organizations responsible for extension work with farmers.
>
> While there are good examples of close liaison in this field, there are many shortcomings which require organized effort to overcome. The Section will seek close contact with both State Departments and C.S.I.R.O. Divisions and Sections. It will prepare accounts of C.S.I.R.O. research of interest in agricultural extension work, facilitate personal contacts between research and extension officers, and organize conferences between C.S.I.R.O. and State Officers on specific subjects or regions.

Sir Ian Clunies Ross' decision to establish the Agricultural Research Liaison Section as a separate entity within C.S.I.R.O. meant that the Section has been able to develop its own identity in relation to other Divisions of C.S.I.R.O. and in relation to State extension services. This is especially important in an organization such as C.S.I.R.O. which traditionally has delegated considerable freedom to plan and implement research programmes to its Chiefs of Divisions and Officers-in-Charge of Sections, each of whom can also apply his own concepts of liaison to the work of his own Division. This same delegation which leaves Chiefs free to develop their research and liaison programmes implies that the Agricultural Research Liaison Section is able to initiate and develop its own liaison and research programmes. The liaison activities depend on the cooperation and understanding of the research officers in other Divisions.

The concept of research liaison applies wherever research and extension services function; there is always need for liaison to interpret and communicate research results between research and extension personnel; liaison also involves 'feed back' from extension to research personnel about problems involved in the application of new knowledge in the field. In Australia research liaison is developing not only between personnel with different functions, but between institutions as well, because an important part of research is done by C.S.I.R.O. and universities which have no responsibilities for extension work. For this reason much of C.S.I.R.O.'s liaison effort aims towards close working cooperation with State extension authorities.

By the time of his death early in 1957, Mr. R. R. Pennefather, the first Officer-in-Charge of the Section, had succeeded in convincing the then State Directors of Agriculture that C.S.I.R.O. had no desire or intent to develop its own extension service. Over the years since then, the States have stressed the need for more effort by C.S.I.R.O. to keep them informed of research work in progress and of new research findings, and a basis of mutual help and confidence is gradually being hammered out. Liaison between research and extension personnel is finding its role as a component of Australian extension services.

Apart from working relations with extension services, C.S.I.R.O.'s liaison effort also involves encouraging research officers to participate in liaison. To many research scientists, liaison is at best a necessary evil. Efforts to keep the extension services informed of work in progress and of new research findings may be thought of as an intrusion into their work programme, especially if initiated by colleagues who 'don't understand the background or the complexities of the problem'. A gradual change in this attitude is discernible among some research officers as the importance and usefulness of liaison activities become more evident to them — not only because they are witness to more effective dissemination of their own results, but also because they see their own problems in a new perspective.

The deep-seated tendency to identify research liaison with public relations has confused the C.S.I.R.O. research scientists' image of liaison work, even though the Agricultural Research Liaison Section is not responsible for C.S.I.R.O. public relations about research concerned with rural industries.

LIAISON PROGRAMMES

'Rural Research in C.S.I.R.O.'

The work of the C.S.I.R.O. Agricultural Research Liaison Section over the last decade has been identified largely by its liaison publications, especially 'Rural Research in C.S.I.R.O.' The journal is written for officers of State Departments of Agriculture, particularly those concerned with extension.

It is designed to present a round-up of C.S.I.R.O. research findings which may be of value to extension officers. The primary purpose is to select topics of likely practical significance, collect appropriate background information and then interpret and discuss the significance of C.S.I.R.O. research results. The 'extension officer' audience includes a broad spectrum of interest and responsibility, ranging from the general practitioner in the country to the head office subject-matter specialist or technical administrator.

Because 'Rural Research in C.S.I.R.O.' provides a rich source of material for the mass media, the rural press and other media give wide publicity to the material in it. Under these circumstances it is easy to lose sight of the concept of liaison which underlies the journal. Special efforts are taken to keep extension services advised of material about to appear in 'Rural Research in C.S.I.R.O.' by distribution of final manuscripts to State Departments of Agriculture several weeks prior to publication.

Cooperative Leaflets

These publications discuss one topic more thoroughly than is feasible in 'Rural Research in C.S.I.R.O.', and involve interpretations of research findings from State Departments of Agriculture as well as from C.S.I.R.O.

Liaison Notes

These notes began in 1958 as a means of providing extension services with ready access to a wide range of miscellaneous research reports from C.S.I.R.O., some unpublished. 'Liaison Notes' is not distributed to the public. It is informal in nature, and enables extension officers to interpret and modify the information to suit the needs of primary producers in their own region. The first 17 issues of the General Series were devoted to trials of different material ranging from advance information about 'Rural Research in C.S.I.R.O.' to extracts from Annual Reports of C.S.I.R.O. Divisions, reports of research in progress, contents lists of Australian Journal of Agricultural Research, and a leavening of other material of professional interest to those concerned with extension.

Dr. G. Moule of the Division of Animal Physiology prepares a series of Sheep Liaison Notes, designed especially for extension specialists in the sheep industry, which are distributed by this Section. By May, 1962, 23 numbers of this series had been issued.

Liaison Tours

The Section has organized liaison tours and conferences which have provided opportunities for closer collaboration between research and extension officers. Over the years these tours have varied from those organized for scientists from different disciplines to discuss regional problems 'on the spot' with extension officers (Southern Tablelands N.S.W. 1952, Northern Tablelands 1953) to tours for extension officers to visit C.S.I.R.O. research laboratories (1959), for commercial firms (1959), and for primary producers' organizations and members of the wool trade (Brisbane 1960 and Melbourne 1960).

Southern Tablelands Regional Research and Extension Study

One approach to the study of how research finds its application in practice is to analyse the use being made of research within the farming community itself. Using established production practices as a base, research programmes can then be viewed in the light of the contribution they could make to production problems in the area. This leads to attempts to define what additional knowledge is needed, and what additional interpretations or integration of the work of different disciplines might be needed, to enable full advantage to be taken of the existing knowledge.

In 1957 a formal working arrangement was made between C.S.I.R.O. and the New South Wales Department of Agriculture to establish the Southern Tablelands Regional Research and Extension Study, to attempt to apply and develop these principles in the Southern Tablelands. This cooperative experimental study is still in progress, and has been described in a series of reports by the Committee, and in articles in 'Rural Research in C.S.I.R.O.'

After five years of work the next stage planned is for an experimental application on individual farms of the results of knowledge so far available. As this next phase of the project relates closely to the extension responsibilities of the New South Wales Department of Agriculture, the Department is taking an increasing responsibility for this second phase of the study. In such regional studies as these C.S.I.R.O.'s participation is designed to face up to problems involved in getting the available research data assembled and interpreted in a way which enables the extension services to apply it in each particular region.

Conferences

The Section organizes the series of technical conferences sponsored by the Standing Committee on Agriculture of the Australian Agricultural Council. From time to time, the Section has initiated other conferences when, for a variety of reasons, it was felt appropriate to do so. The best known of these have been the Rabbit Control Conferences (Melbourne 1958, Sydney 1960) and the Northern Territory Scientific Liaison Conference, 1961.

Newsletters

Opportunities for further exchange of information in the interim between conferences is provided by newsletters. The Horticulture (1960), Vegetable (1960), and Weeds (1962) Newsletters have been established in pursuance of resolutions at the technical conferences, and are edited in the Section.

Liaison Officers — Canberra and Sydney

The Section's Canberra Liaison Officer was appointed to Canberra in 1958. His special responsibilities have centred around the work of the Southern Tablelands Regional Research and Extension Study.

In May, 1960, an officer of the Section began duties as Sydney Liaison Officer, with his office located in the New South Wales Department of Agriculture. His particular responsibilities have included the provision of on-the-spot assistance to State Departmental officers in gaining access to C.S.I.R.O. research results and to reports of work in progress.

It is important to bear in mind constantly that all these liaison activities are a means to an end and that this end should never be lost from sight. The end is the effective interpretation and dissemination of C.S.I.R.O. research findings. It may be pursued from opposite directions, even though there is common ground between the two approaches. The first alternative is to assess the problems and needs of the rural community and how they can be resolved by effective use of the available research information. This is the purpose underlying such liaison projects as the Southern Tablelands Study, the Rabbit Control Conference and the Northern Territory Scientific Liaison Conference, cooperative leaflets, and some of the articles chosen for inclusion in 'Rural Research in C.S.I.R.O.' Alternatively, our liaison activities may start from the C.S.I.R.O. research findings themselves, seeking and probing ways by which these can be applied in practice. This second approach underlies 'Rural Research in C.S.I.R.O.', 'Liaison Notes', and liaison tours.

STAFF

As the Section's work has developed, the need for different specialists has become more and more apparent. Graphic design has played an especially important part in the publications programme, and the graphic standards of our work have been raised by the appointment of professionally trained graphic designers. The staff now includes 12 graduates in agricultural or veterinary science. Of the 12 graduates, three have been recruited from C.S.I.R.O. senior research staff, two as new graduates, two from Commonwealth government service, one each from State extension services, private practice, commerce, and overseas, and one after a postgraduate research project. Six officers have had overseas graduate training or experience in extension, agricultural journalism, communications, agronomy, or agricultural economics.

CONCLUSION

For the foreseeable future, different attitudes towards research and conflicting motives between different institutions, between different research workers, and between research and extension officers make periodic failure in *rapport* between human participants almost inevitable. For these failures we seek tolerance, in the belief that as a profession of extension develops in Australia there will be a common bond of professional interest which will make these differences of viewpoint a source of stimulation rather than of frustration and annoyance.

PAPER 11

AGRICULTURAL EXTENSION IN NEW ZEALAND

By S. H. SAXBY*

Before considering the functions of an agricultural advisory (extension) service, it is desirable to give some thought to the various matters which determine whether or not such a service is desirable and possible.

It is first necessary to be satisfied that such a service is wanted by the people for whom it is to be provided. There is little point in establishing a service only to find that it is not acceptable. For example, some farming communities may feel that they are progressing quite satisfactorily without an advisory service; others may feel that if they want advice, they would prefer to get it from a local successful farmer; others may feel that although they want advice, they would prefer to get it from someone who has had experience in addition to a college education. All such reservations are at least partly valid. Experience in New Zealand shows, however, that these attitudes towards formal advisory services are steadily becoming less and less significant. During the last few years, the demands for advisory services have far exceeded the ability of those responsible for the organization of the services to provide staff to cope with the demands. The restriction has been due mainly to availability of suitable persons rather than to salaries paid. There are nevertheless still some groups of farmers who are only now realizing the value of an organized advisory service.

The second matter to be considered is the type of service which can be provided. A service, to be of value to the farmer, must offer what the farmer wants. The service to be provided should therefore mainly be determined not by the organization but by the farmers. It is, however, impossible to devise an advisory service to suit all farmers because the type of service required varies from district to district and from farmer to farmer. Some farmers might want detailed advice on the running of their farm as a whole, embracing techniques, management, and economics.

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There has been a good deal of talk, perhaps rather loose and not well considered, suggesting that the only worthwhile advisory service is one which advises on the running of the farm as a whole. Although this may be desired by some farmers, it does not take into account the fact that many farmers do not require such a service. For example, a farmer may require advice on the control of an insect pest, or a specific weed, or he may want information about a fertilizer which he has seen advertised. Such a farmer would certainly not be interested in getting advice on the running of his farm. The time could, and often does, come, when such initial advisory work does result in 'whole farm' advice. This usually comes only after the farmer and the advisory officer have got to know each other.

It must be realized that, in New Zealand, 'part farm' rather than 'whole farm' advice is what is generally wanted, and that it is this type of advice that has dominated advisory services for many years.

The third matter to consider is the ability of the advisory organization to provide sound advice. Sound advice depends largely on the individual adviser, but he cannot give sound advice unless he is backed with knowledge gained by himself or other closely associated organizations such as research stations.

In New Zealand there are three main groups of persons engaged either fully or part-time in giving advice to farmers. The first group is that attached to State or college organizations whose salaried staff are employed for this particular purpose. It is this group, particularly that provided by the State, which provides the major advisory service, and which is the subject of elaboration later in this paper. The second is the group, at present comparatively small, which sells its services as does a private practitioner. This includes the paid servants of Farm Improvement Clubs, and also a few advisers who have set up in private practice. The third group is that which gives its advice in association with trading activities. This group is large in some cases, and has a considerable influence, particularly when it may control the purse strings of its clients. Although there are still some fly-by-night, get-rich-quick trading organizations who do not give sound advice, it is desirable to emphasize that the well established reputable trading organizations in New Zealand generally provide basically sound advice. They realize that continuing sound advice results in satisfied clients and the prosperity of both the client and themselves. There is a marked trend for such organizations to recruit staff with a good academic training.

The Development of Agricultural Extension Services in New Zealand

Because the main advisory service is provided by the Department of Agriculture, this will be used as the basis for discussing development in New Zealand.

The Department of Agriculture was established in 1892, and its field staff was appointed mainly to carry out inspectorial duties, particularly those dealing with animal diseases. It did, however, later recruit from time to time several specialists at its head office to deal with biology, pastures, and soils. These officers did develop an advisory service in connection with their field work, but it was of necessity on only a small scale. It was from the operation of these inspectorial and limited specialist services that the need for an advisory service became apparent.

Such a service was being slowly established when it was rendered almost inoperative as a result of the 1914–18 war.

The advisory service as it now exists really had its foundations in the early 1920s. The need for such a service was there. Land was still being developed, but the main problem to be dealt with was the reversion of much of the hill country to second growth, and ultimately to forest. At the same time, the then only agricultural college (Canterbury Agricultural College at Lincoln) was beginning to turn out agricultural graduates who were looking for jobs in the field of agricultural research. Several of these few graduates joined the advisory staff of the Department, which numbered 14 in 1925. Over the years, this advisory staff, which now includes a number of specialists, has increased to about 150 with a constant demand for increased services.

During the last few years, stock inspectors have been re-designated 'Livestock Instructors', with an increasing content of advisory work in their duties. The expansion has included the appointment of Poultry Instructors, Sheep and Wool Instructors, and Horticultural Instructors. The foregoing shows that, over the years, there has been an increasing demand for, and consequent provision of, advisory services, in those groups whose functions have been chiefly inspectorial.

The growth of the Department of Agriculture's advisory service has been paralleled by a growth in research, mainly into animal management, soil fertility, and crop and pasture production. Some of this research is conducted by research stations of the Department of Agriculture and of the Department of Scientific and Industrial Research, and some by advisory officers on farmers' properties throughout the country. A considerable amount of research is also carried out by the two agricultural colleges (Lincoln and Massey).

Advisory work and research must be complementary. Much of the research carried out would be ineffective without a good advisory service. Even with the existing advisory service, attention is frequently drawn to the fact that research results are being adopted too slowly by the farming community. Similarly advisory work would stagnate if research were not conducted and made available to advisory officers. The closer the control of research and advisory work is knit, the more value will accrue from each.

Dairy Production and Marketing Board.—At the same time as the Department of Agriculture was expanding its advisory services, other advisory services were commenced or expanded. At present there are twelve Consulting Officers employed by the Dairy Production and Marketing Board. These officers serve dairy farmers throughout New Zealand. Because there are so few of them, they have concentrated, very successfully, on group instruction and pioneered the farm discussion group technique.

Farm Improvement Clubs.—These started in 1952 as the result of a desire by a group of farmers to have a specialized 'whole farm' service which the Department of Agriculture was unable to provide because it was unable to divert staff. The movement has grown considerably, until now there are 22 clubs employing 26 advisers, each of whom is responsible to a group of about 50 farmers.

Agricultural Colleges.—Although the main function of the two agricultural colleges is teaching, each conducts a considerable amount of research and some advisory work. Each college conducts conferences for farmers to which both college staff and outside speakers give support. Lincoln College provides an advisory service for about 80 farmers, for which a charge is made.

Other Government Departments.—Although no other Government Departments conduct an organized advisory service, such a service is often given as incidental to their main function. The Departments of Lands and Survey and Maori Affairs are responsible for land administration and their officers must, of necessity, give advice to their 'clients'. Similarly, the State Advances Corporation, by virtue of its dealings with a large number of rural mortgages, gives advice to ensure that its security is maintained by the achievement of maximum efficiency by its mortgagees

The Department of Scientific and Industrial Research has, over the years, provided a great deal of useful information on soils, insect pests, pasture production, and plant diseases. Although it is not an advisory organization, its officers are in constant demand for lectures to farmers.

THE ORGANIZATION OF ADVISORY SERVICES IN THE DEPARTMENT OF AGRICULTURE

The Department of Agriculture is divided into five Divisions, each of which has a Director, who is responsible to the Director-General. The following are the Divisions, with an indication of the advisory content of each:

1. *Administration Division* — is purely administrative, and provides clerical services for all other Divisions.

2. *Animal Industry Division* — is mainly concerned with animal diseases. It is organized to deal with any outbreaks of serious disease in stock. It also conducts the meat inspection service at all freezing works. Its Livestock Instructors throughout the country carry out some advisory and investigational work into animal health and husbandry. Under this Division also come Poultry Instructors and Sheep and Wool Instructors. The main function of the Division is, however, regulatory.

3. *Dairy Division* — is concerned mainly with the production and processing of milk. Its duties are largely inspectorial, but instruction is given in shed hygiene and processing.

4. *Farm Advisory Division* — is responsible for general advice on all aspects of farming. It controls three research stations and several soil conservation reserves, as well as the Seed Testing Station. It also conducts the seed certification scheme.

5. *Horticulture Division* — provides both inspectorial (where appropriate) and advisory services on matters relating to orchards, market gardening, and home gardening.

FARM ADVISORY DIVISION

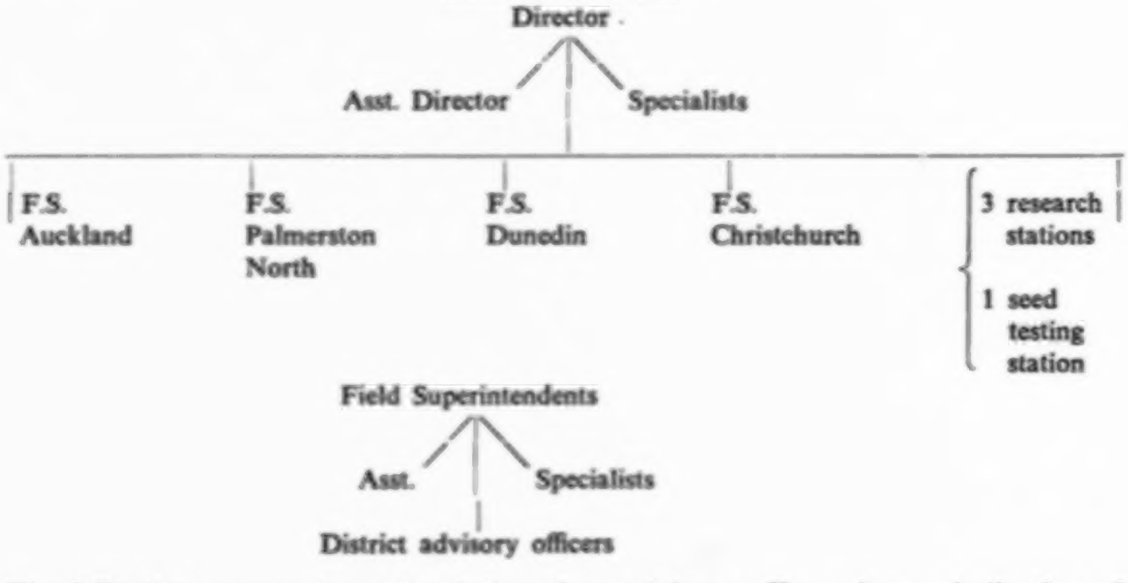
Because the Farm Advisory Division is the only Division whose function is primarily advisory, its organizational structure will be discussed. The structure of other Divisions is, however, basically similar. The Director of the Farm Advisory Division is stationed at Departmental headquarters in Wellington and is responsible to the Director-General for all matters relating to the work of his Division. He is supported in Wellington by an Assistant Director and a number of senior specialist officers.

For the purpose of Divisional organizations, New Zealand is divided into four regions (superintendencies) — two in the North Island and two in the South Island. The work in each of these is controlled by a Fields Superintendent, who is supported by an Assistant Fields Superintendent and some specialist officers. Each superintendency is divided into a number of districts in which there is at least one resident advisory officer. The number of districts in a superintendency is determined by local requirements and by the availability of staff. Stationed in each district is at least one resident advisory officer, who may have with him one or more advisory or specialist officers. The key men in the advisory service are the resident advisory officers, who are responsible for all advisory work of the Division in the district.

The Director of the Farm Advisory Division also has under his control three research stations and the Seed Testing Station.

The chart shows the essential features of the organization of the Division.

ORGANIZATION CHART


Director
Asst. Director
Specialists
F.S. Auckland
F.S. Palmerston North
F.S. Dunedin
F.S. Christchurch
3 research stations
1 seed testing station
Field Superintendents
Asst.
Specialists
District advisory officers

The following comments on the duties of an advisory officer give an indication of the two main lines of duties, as well as examples of some of each.

DUTIES TO THE FARMER

Service to the Farmer

The advisory officers provide a service to the farmer in many ways, such as personal visits, written and telephoned answers to enquirers, field days, farm schools, radio talks, newspaper articles and articles in the New Zealand Journal of Agriculture, exhibits at Agricultural and Pastoral Shows, and through the Young Farmers' Clubs.

Service to the Department

This duty tends to be overlooked. The advisory officer has to service not only the farmer, but also his Department and Minister. He is often asked to investigate and report on matters which may arise at Ministerial, upper Departmental, or Divisional level. Some of these investigations are of local significance, when a farmer writes for information regarding his own property. On the other hand, a report may be required on a national basis on, say, rural housing, or some other matter in which basic information is required in order that a policy decision may be made. During the recent drought, advisory officers in all affected areas were asked to submit weekly reports on conditions in their areas. These reports were used to provide an assessment of the position.

The advisory officer may, and often is, required to be the Departmental representative on various local committees such as marginal lands and soil conservation, and locally run demonstration farms. Because of the comparatively large number of advisory officers who cover the whole of New Zealand, they are also called on to assist not only specialists in their own Department, but also in other Departments in matters such as surveys and special investigations.

An important part of an advisory officer's work is concerned with experimental work in his own district. Some of this work is related to national surveys (e.g. sulphur responses on pasture) and some is related to local problems which he himself wishes to investigate. About 2,000 of these are in operation throughout the country.

STAFF

Table 1 shows the distribution of staff whose duties are mainly concerned with 'general practitioner' advice to farmers. The table does not include officers who are engaged primarily on research either at research stations or in the field. Nor does it include specialist officers at headquarters or other officers whose duties are mainly administration. The number of officers in a district varies according to the requirements and size of the district. Many districts have only one advisory officer, but some have up to eight. Table 2 shows that over half of the districts are staffed by only one advisory officer. This tends to create staffing difficulties when resignations are received by officers in one-man districts. Because it is not always possible to transfer an experienced officer to such vacancies, it is often necessary to absorb the vacant district into an adjoining one on a temporary basis For the above reason, 'two-man' districts are liable to suffer less disruption in service as the result of resignations.

TABLE 1

DISTRIBUTION OF 'GENERAL PRACTITIONER' OFFICERS

Superintendency	No. of districts	No. of staff
Auckland	21	28
Palmerston North	13	24
Christchurch	14	34
Dunedin	9	18
	57	104

TABLE 2

NUMBER OF OFFICERS IN DISTRICTS

No. of officers	No. of districts
1	32
2	12
3	10
4	1
5	—
6	1
7	—
8	1
	57

The officers listed in Table 3, as a general rule, work throughout a superintendency and do not have restricted districts as do the 'general practitioner' officers.

TABLE 3

DISTRIBUTION OF ADVISORY STAFF OTHER THAN GENERAL PRACTITIONERS

Superintendency	Soil cons.	Machinery	Drainage	Home science	Economics	Total
Auckland	2	1	1	2	3	9
Palmerston North ..	8	2	1	2	2	15
Christchurch	8	1	1	2	4	16
Dunedin	2	1	2	2	2	9
	20	5	5	8	11	49

Number of Farms in Districts

Districts vary greatly in area, shape, and number of holdings. Some districts are comparatively large, but contain only a comparatively few holdings. Others are fairly small, but contain many holdings. Some districts are compact and these allow the advisory officer to get home each night. Others are badly shaped, with the officer's headquarters at a considerable distance from some extremities, necessitating his staying away from home a good deal.

TABLE 4

SIZE OF DISTRICTS BY NUMBER OF HOLDINGS

No. of districts	No. of holdings
1	1- 100
6	101- 500
15	501–1000
5	1001–1500
17	1501–2000
7	2001–2500
2	2501–3000
3	3001–3500
—	3501–4000
1	4001–4500
57	

Because of these variables, it has not been possible to establish criteria on which it is possible to accurately assess the needs of all districts. The only figure that can be used, and then with reservations, is that relating to the number of holdings (see Tables 4 and 5).

TABLE 5

SIZE OF DISTRICTS BY NUMBER OF HOLDINGS PER ADVISORY OFFICER*

No. of districts	Holdings per advisory officer
1	1- 100
10	101- 500
24	501–1000
10	1001–1500
7	1501–2000
3	2001–2500
1	2501–2600
56	

* This is based on authorized establishment. Note that no information is available for one district.

Table 5 shows that about two-thirds of the advisory officers are servicing 1,000 or fewer farmers. It is planned to bring all officers into the 'less than 1,000' group by additions to staff when they become available. The 'over 1,000' groups are mainly in the dairying districts where the holdings per district are numerous and comparatively small.

Qualifications

When advisory services were first started, recruits were mainly persons with farming experience, but with no formal or academic training in agriculture. At that time degrees in agriculture were virtually unknown. The next stage was the recruitment of staff with diplomas and a small number with degrees. During the 1930s, about half the recruits were holders of diplomas, the other half being holders of degrees or persons with no formal qualifications. Since the last war, the number of graduates from the agricultural colleges has increased considerably, and the current policy is to recruit only graduates, except under special circumstances. The gradual change from the recruitment of persons with only farm experience to the recruitment of graduates almost exclusively is due to two factors. First, the number of graduates has increased, and second, the present complexity of duties of an advisory officer requires a good formal agricultural education. A graduate entering the service is much better equipped for his work than is a non-graduate. It should, however, be appreciated that experience and general competence is a great leveller. We have a number of senior non-graduates who are doing a very good job and who are certainly superior to some graduates with only limited service and experience. During the last 20 years or so an endeavour has been made to relieve advisory officers of certain routine duties which they previously had to perform. This has been achieved by the appointment of 16 technicians to assist with field experiments, and 17 seed certification assistants and 13 seed dressing officers to assist with seed certification.

Promotion

Promotion can be based on one of two principles. In the first, the position is graded, and if an officer desires promotion out of his grade, it is necessary to apply for a position in a higher grade. This usually necessitates a change in job content, and may also involve a transfer from one Department to another or from one locality to another. This is satisfactory for clerical work where the relative values of jobs can be assessed, and where similar jobs are available in different Departments and locations. It is, however, an undesirable principle on which to base the promotion of advisory officers. First, it would be unreasonable to try to determine salaries which should be attached to various districts. All districts have a potential for advisory work and that potential is developed by the officer and not by the district. For this reason no one district is regarded as being senior to another, but account, of course, is taken of the suitability of some officers for specific districts. Second, if districts were graded, there would be a constant series of transfers which would be upsetting to both the staff and the farmers.

The second principle on which promotion is based is that of grading of officers. It is this principle on which the promotion of advisory officers in the Farm Advisory Division is based. The effect of this is that an officer can gain promotion year after year without having to change his district, provided, of course, that his competence in relation to other officers warrants promotion. Transfer of staff is, however, necessary, sometimes to fill vacancies and sometimes to place an officer in a one-man district after he has gained experience and training in a several-man office. Such transfers are at existing salary and grading.

Training

On appointment to the staff, recruits are posted to districts for training under an experienced officer. After a period of 1 to 2 years, they are sufficiently conversant with the work to enable them to take charge of a district. Every endeavour is made to provide an induction course for staff after they have been on the job for about 6 months. This is considered preferable to holding such a course as soon as they are appointed. The delay of 6 months enables them to gain some experience which enables them, at the induction course, to discuss problems which they have actually met rather than problems which they probably will meet.

Each year staff training courses are run for all groups of officers. During the last few years, the nature of these courses has been changing from conferences in which papers are read to courses in which the discussion-group technique takes a major part. Special courses are also held as the occasion arises to inform selected officers on recent developments in matters such as weed control, field experiments, and tussock grassland management. Each year, conferences are run by the New Zealand Grassland Association, the New Zealand Weed Control Conference, the Institute of Agricultural Science, and the Animal Production Society. Selected officers are authorized to attend these.

Specialist officers and Superintendents are constantly visiting the field staff and, although this is not regarded as formal training, the beneficial effect of such visits must be considerable, as many problems peculiar to the officer in his district are ironed out.

SECTION II

Comparative Agricultural Extension

LIST OF PAPERS

PAPER NO.

12. Comparative Agricultural Extension. *By* R. N. Farquhar.
13. Agricultural Advisory Services in England and New South Wales. *By* J. L. Green.
14. Agricultural Extension in South-east Asia and its Relation to Australia. *By* M. B. Spurling.
15. The Applicability of the Extension Methods of the New Zealand Dairy Board to the Queensland Dairying Industry. *By* J. G. Young.
16. The Consulting Officers Service of the New Zealand Dairy Board. *By* K. M. Sillcock, C. J. Bradbury, K. E. Flynn, and H. P. Edgoose.
17. Extension Work with Rural Women. *By* Nancy M. Foskett.
18. *Withdrawn.*
19. The Australian Institute of Agricultural Science and the Development of Extension. *By* A. F. Gurnett-Smith.

REVIEW

By R. N. FARQUHAR*

Mr. Chairman, Mr. Penders, ladies, and gentlemen:
First, may I say what a pleasure it is to me to be a part of this Conference. I feel quite sure that, in the future, this will be recognized as a notable milestone in the development of professional agricultural extension in Australia.

May I take this opportunity to thank you all for being so helpful (and tolerant when necessary) to me in my role as Organizing Secretary for this Conference. As far as I am concerned, every person and every organization represented at this Conference have been very helpful and obviously keen to make it truly representative and successful.

Next, I would like to thank the Organizing Committee for inviting me to present a paper on comparative agricultural extension and to act as reviewer for the 'Comparative Extension' session. It is a line of work in which I have been particularly interested for some years and one which Mr. Penders and I discussed in some detail in both America and the Netherlands, two or three years ago.

We have just heard Mr. Penders give an interesting and stimulating talk on extension overseas. We have noted the number of changes in extension philosophy, organization, and operation which have occurred in several countries in the last decade or two. The inference is that extension must progress and change to meet the needs of a changing world. The degree of the extension leadership will determine whether extension will help to guide, or merely follow, the changes in its environment.

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* Agricultural Research Liaison Section, C.S.I.R.O.

To be worthwhile, comparative extension studies demand objectivity from all of us. I guess most of us, including our overseas guests, came to this Conference 'prepared to learn'. I wonder what we were prepared to learn?

I suppose we certainly were prepared to receive additional information. We even may have been prepared to receive new information. But probably few have been mentally prepared to accept new ideas and information which conflict with our own basic ideas and concepts concerning extension work, and which would involve us in change. I guess most of us are willing and anxious to change the other fellow's ideas and actions, but quite unprepared to accept changes for ourselves. But change is inherent in the whole concept of comparative extension.

The 'Comparative Extension' session is primarily concerned with the points raised in papers 12 to 19, although of course all the Conference papers have some relevance to comparative extension. Many papers have equal relevance to two or more sessions of this Conference. Papers 1 to 11 are more than background papers for the present session. They supply a lot of information of direct comparative extension value.

My own paper, number 12, supplies some historic background for extension education in general, and in particular for those programmes which developed into agricultural extension in the United Kingdom and the United States — the two countries which have had most influence on Australians. In both cases a special extension organization has been developed, based on 'agents' or 'officers' who speak across the board on all subject-matter areas, as does the farmer himself. This paper discusses the concurrent trends towards forms of extension that cover a much broader field than the technical aspects of agricultural production, and at the same time towards the supply of a higher standard of specific technical information to progressive farmers. It has the temerity to suggest an operational definition of the term 'agricultural extension'.

Paper No. 13, by Mr. J. L. Green, is a comparative study of the agricultural advisory services of England and New South Wales. The major difference pointed out was that the New South Wales extension officers, although integrated to some degree on a regional basis, were primarily members of the separate Divisions of the Department of Agriculture, and not of one extension service as in England. Compared to New South Wales, farm management advice by the English advisory service is facilitated by the years of accumulated economic data, by the stable local markets, and by their integrated multi-subject-matter based extension organization.

In paper No. 14, Mr. Spurling suggests the need for a centralized organization to provide a collating and distributing centre for extension information for South-east Asia. Countries in the area have a lack of overseas publications and virtually no scientific intercourse within the region. His studies of the South-east Asian situation produced many interesting thoughts for Australian extension workers. He states that ultimately the answer to the problem of getting extension information to the farmer is one of raising the educational standard of the whole country — the narrower the gap becomes between the educational level of the research worker and that of the farmer, the easier is the extension job. We come back to the point that the whole educational system and standards are of concern to agricultural extension. Mr. Spurling points to the need for a better integration of Australian resource allocations to ensure an appropriate balance between fundamental research, applied research, and extension.

The next two papers, No. 15 by Mr. J. G. Young and No. 16 by Messrs. Sillcock, Bradbury, Flynn, and Edgoose, discuss the extension work of the New Zealand Dairy Board and its application to their States, Queensland and Victoria respectively. The industry financially supports the Board's 'consultant officer' staff. They have no regulatory or field experimental responsibilities, but have the backing of active dairy research institutions. Consultants have the whole-farm approach to the dairymen's problems. They have had great success in fostering numerous small neighbourhood discussion groups for extension purposes. The Victorian authors acknowledge the influence of the New Zealand approach on their extension work. Mr. Young states that the dairymen in Queensland are in need of management advice if they are to maintain their appropriate place in the social and economic structure of the community. He points to the difficulties of implementing this when existing Departmental services are structured on a commodity or subject-specialist basis, and when extension staff has additional responsibilities in regulation or field experimentation or both.

It will be noted that no paper was submitted on rural youth and Junior Farmer activities and only one on extension work with rural women. The latter is paper No. 17, by Miss Nancy Foskett, which describes the small but active Women's Extension Service of the New South Wales Department of Agriculture. While most countries' women's extension services are primarily concerned with the home and family, Miss Foskett points out that the woman who finds out what extension has for her is more likely to be a positive extension influence on her farmer husband, and to be a keen supporter and sometimes instigator of change. Similarly, group extension activities that involve the women are more likely to make a bigger impact than those that do not.

The final paper in the group under review is an appropriately important one. It is a review of the role of the Australian Institute of Agricultural Science in the development of extension in Australia, by Mr. A. F. Gurnett-Smith. This paper points to four current concerns. The first is the need for a definition of extension. The loss of efficiency due to the lack of a clear-cut objective for extension is pointed out. The second point made is the necessity to introduce into the undergraduate course those social sciences basic to extension work, and to institute post-graduate courses for graduates with some years' experience. The necessity for research into extension, as a basis for extension training and operation, is the third point documented. The final point made in Mr. Gurnett-Smith's paper on behalf of the A.I.A.S. is that the Institute membership includes less than 20% of the Australian agricultural extension workers and that this country has no organization representative of extension workers. The Institute offers its assistance in developing some form of mutually acceptable organization.

Mr. Chairman, many of the points selected for mention in this review will be referred to again in later sessions dealing with some particular phase of extension work. Mr. Penders has already discussed some aspects of them in his overseas comparative paper. But the authors of the six papers reviewed in this session appear to ask the following major questions:

1. What are extension's real aims and ultimate objectives? What are the Australian philosophies of extension?
2. Should the extension services aim at providing (a) whole-farm advice; (b) farm management education; (c) whole farm-family extension education; and/or (d) rural community development stimulation; as well as specialist technical information as required?
3. The North American countries and those European and other countries which have reorganized in latter years have special integrated extension services with general-practitioner bases supported by husbandry and subject-matter specialists. Within the Australian States and Territories, we have the whole range of types of organization. Is there a type of organization which is best suited to Australian extension needs?
4. What type of extension worker is required and how and where should he be trained?
5. Who should undertake any research into extension? What is the role of the universities in extension research and training?
6. Is there a need for a professional society for agricultural extension workers in Australia?

I expect that all these questions will be answered directly or by inference this morning or before this Conference ends this week. But we have overseas visitors here today who, I am sure, have faced these same questions before. I would be interested if their wide international experience suggested any possible answers.

A COMPARATIVE EXTENSION STUDY IN THE NORTH ATLANTIC AREA

By J. M. A. Penders*

No other continent shows such a great national diversity as Europe, expressed in languages, currencies, trading systems, ethnic differences, etc. Similarly its systems of agricultural extension vary greatly in origin, organization, relationship to other services, intensity, and fields and methods of work. But the growing cooperation between many European countries is one of the major advances achieved in the post-war era. European extension development has benefited from this increased international cooperation.

Growing Cooperation in Extension Work

A Conference of European Agricultural Services was held in The Hague in 1949 under the auspices of F.A.O. In the following year, 14 of the European countries belonging to the Organization for European Economic Cooperation (O.E.E.C.) undertook, within the framework of the Organization, a critical analysis of their extension services. It was carried out by working parties of European and American experts visiting and studying countries other than their own, and by joint consultations. Besides providing detailed accounts of the extension systems in individual countries, together with specific recommedations for the improvement of extension work in these countries, recommendations were made which were believed to be generally applicable. The study of agricultural extension work on an international basis was continued by means of conferences held in 1953, 1957, and 1960. In addition, many seminars were held for specialized extension workers on subjects requiring particular attention. Since 1955, international cooperation in agricultural extension has been extended to include the related field of rural home economics extension.

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* Director of Agricultural Advisory Services, Ministry of Agriculture and Fisheries, The Netherlands.

At the end of 1950 a group of experts from 13 European countries supplemented the work sponsored by O.E.E.C. by studying the United States agricultural extension system. These visits to the United States were repeated in 1954, and again in 1959, when Canada was also included. This North Atlantic area cooperation has been consolidated recently by the grouping of the 18 European member countries of O.E.E.C. with the United States and Canada to form the Organization for Economic Cooperation and Development (O.E.C.D.).

Since 1956 the European Commission on Agriculture of the F.A.O. has sponsored four meetings on extension, vocational training in agriculture and in home economics, and rural youth.

Article 42 of the Treaty of Rome of the European Economic Community (E.E.C.), ratified in 1958, specifies as its aim the promotion of coordination of extension, education, and research in agriculture. In 1962 the E.E.C. established a commission on agricultural extension.

This paper concentrates on the comparative extension developments in the North Atlantic countries since 1950.

THE COMPARATIVE DEVELOPMENT OF EXTENSION SERVICES IN THE UNITED STATES AND THE NETHERLANDS

The Relationship Between Extension, Vocational Teaching, and Research

In both countries vocational teaching was the first of these three to be introduced as a public service, followed by research, and later by rural extension.

In the United States, vocational teaching at the academic level received, right away, a firm basis in the more or less autonomous agricultural universities, the so-called land grant colleges, the first of which was founded in 1862. Around these State colleges were successively grouped applied research and extension. This ensured close working relationships between these activities at the State level. Non-academic vocational agriculture teaching institutions remained separate, as part of the general secondary school system. In 1887 an association of the land grant colleges was formed to ensure their coordination on a national basis. In 1914 a cooperative rural extension service was established for the entire country, involving the federal Department of Agriculture, the State agricultural universities, and the county authorities.

In the Netherlands, extension work developed from, and is still strongly supported by, the work of the non-academic vocational agriculture schools which were initiated in 1876. The Agricultural University was established in 1918. In the European university tradition, the Agricultural University has no formal links with the research and extension operated by the specialized departments of the Ministry of Agriculture and Fisheries. In the Netherlands, extension workers are associated more closely with research and vocational teaching than is the case in the United States, particularly at the regional level.

The Relationship Between Agricultural Extension, Rural Home Economics Extension, and Rural Youth Extension

In the United States, integrated rural extension work covering agriculture, home economics, and rural youth operated as early as the first decade of this century. This concept of extension work involving the whole farm family was adopted by the national cooperative extension service to the degree that professional home economists and rural youth workers are approximately equal in number to the agricultural extension agents.

In the Netherlands, rural home economics education and extension were initiated and received impetus during the economic depression of the nineteen-thirties. There is now a chair of Home Economics in the Agricultural University. Home economics extension works with and through the rural women's organizations and the largely denominational home economics education system. Rural youth extension in the Netherlands is less intensive than in the United States, but vocational agricultural education is more intensive. It is estimated than 90% of the Netherlands' future farmers now enjoy agricultural education in specific vocational schools.

The Functional Structure of the Extension Services

Rural extension is more specialized (on a subject-matter or industry basis) in the Netherlands than it is in the United States. This is in part a reflection of the differences in specialization and intensity between the two countries' agriculture, and in part a reflection of the fact that the American extension is more 'educational' in concept. The ratio of all-round agricultural advisers to specialized extension officers in the Netherlands is 1 : 2. In the United States this ratio was 5 : 1, but in recent years there has been a strong trend towards increasing the numbers of specialized extension workers as a consequence of greater specialization in agricultural production. This trend is obvious not only at the State level, but also in districts and sub-districts (comprising several counties) and even in counties. At the same time, farm management extension has been expanded and now often includes elaborate management plans based on budgetary techniques worked out by research.

In the Netherlands, also, there is a shift towards farm management extension along with a high degree of specialization in extension, reflecting a rapid change in the relationship between the production factors of land, labour, and capital. The coordination of the Netherlands' individual extension services for agriculture, horticulture, and animal husbandry is growing gradually, assisted by the appointment of coordinating officers and committees.

The extension services in the United States are more decentralized than in the Netherlands. This is influenced by the fact that the Federal, State, and local authorities contribute about 40%, 30%, and 30% respectively to the cost of the cooperative extension service. In the Netherlands, on the other hand, there is a government extension service whose expenses for the major part are borne by the central authority.

Extension Staff

The number of staff in the rural extension services in the United States rose from 1,500 in 1913 to 9,000 in 1940, and to 16,500 in 1960. The number at the federal level is approximately 100, at the State level 5,000 and at the county level a good 11,000. The number of specialists who are working at the State level amounts to 2,500. About one-tenth of all extension workers are engaged in rural youth extension, one-third in home economics extension, and half in agricultural extension. On an average the local agricultural agent covers 1,000 farms, about 500 of which are run on a commercial basis. In addition, the specialists and home economic and youth agents have supporting or complementary roles.

In the Netherlands, the number of permanent staff on the extension service rose from 50 in 1910 to 400 in 1940, and the present constant number of 1,400 was reached in the 1950s. Approximately 400 farms of over 3 hectares (7½ acres) are covered by each extension officer, who in turn is supported by, relatively, twice as many specialists as his American counterpart.

In contrast to the Netherlands, the entire extension staff of the United States consists of university graduates, with educational requirements increasing. Higher degrees are demanded for State-level extension appointments in about half the States. A master's degree in extension as such can be obtained in 30 States and a doctor's degree in extension in 4 States. Some institutions offer special national- and international-level extension study and research facilities. Examples are the centres for 'Agricultural Communications' at Michigan, for 'Extension Administration' at Wisconsin, and for 'Comparative Extension' at Cornell. In the Netherlands, only one-seventh of the total manpower of the rural extension is university-trained. At present the establishment of a chair of Extension at the Agricultural University, Wageningen, is being considered. Most of the extension officers are 'assistants', with certificates from agricultural secondary schools, who are given in-service training and are supervised by graduate extension officers.

Scope of the Extension Services

The differences in production and living conditions between the agricultural populations of the two countries are tending to become less pronounced. The American rural society is less traditional than that of the Netherlands. There is a probable difference of a quarter of a century in the relative degrees of rural urbanization and social development. But the two countries have shown great similarities in the character of the structural changes of the rural scene during the past decade. Decreases in the farm labour force and in income relative to the nation as a whole, and increases in average farm acreage, commercial farming, specialization of production, and 'vertical integration' of agriculture are mutual trends, although these are of more recent date in the Netherlands.

The numbers of persons engaged in agriculture have been decreasing in the United States and, more recently, in the Netherlands. The present rates of decrease are 4% and 2% per annum, respectively. But the agricultural productivities per man-year have been rising by 4% and 5%, respectively. Intensive rural mechanization in the United States preceded that in the Netherlands. At present, the cost relationship of a tractor-year to a man-year in the United States is 1 : 1, in the Netherlands it is 2 : 1. The average farm size in the United States is almost ten times that in the Netherlands. The land price per acre is, however, less than one-tenth of that in the Netherlands. The average investment in agriculture per person employed is approximately equal for both countries. In both countries, the index figures of the prices obtained for agricultural produce are diminishing as compared to the general cost factors in agriculture.

Judged on the basis of, say, electrification, telephone communication, regional water connections, refrigerators, and range of domestic labour-saving appliances, the rural level of living in the United States is higher than that in the Netherlands. A much greater proportion of rural women, married and unmarried, are employed in non-farm jobs in the United States. This is one of the reasons why home economics advice, and domestic labour-saving equipment in particular, are so popular in that country.

The wide field of activity covered by the American extension services keeps spreading. It comprises not only agriculture, but also rural home economics and youth education outside the school, all of which form part of one service. It is in fact, because of the way the service is financed and directed, aimed at the whole rural population, in which the purely agricultural element is numerically decreasing. In the Netherlands, agricultural extension services are completely attuned to that part of the population which is actively engaged in agriculture and hitherto has been almost exclusively directed at the farm operators. Extension services for hired agricultural workers have begun to develop in recent years only. Rural home economics extension and rural youth extension too are chiefly directed at the farm population. With regard to actual extension, we find that in the United States more attention has been devoted to production per man than to production per acre because of the economic conditions prevailing there, although the production per acre has assumed greater significance in recent times. In the Netherlands, we find that an opposite trend has developed in recent years.

In both countries the average profit margin is dropping and the variation of the profit margin between the individual farms is increasing due to greater demands made of farm management. In view of the rapid changes in the relationships between the production factors, extension in farm 'organization' will grow relative to extension in farm 'operation'. With regard to budgeting techniques developed for this purpose, the United States services have progressed further with their 'farm programme planning', a form of budgeting technique to be considered as a transition between a simpler form of budgeting and linear programming. In the Netherlands, however, the simple form of budgeting based on certain branches of the farming activity, namely per surface unit and livestock unit, is finding a wider application; it is already applied on one-third of all farms. In the United States, individual and group extension has been increasing since 1953 with the help of additional staff allocated to its intensified integrated farm and home management programme.

The American extension service pays particular attention to systematic extension work in regard to the marketing and utilization of agricultural produce. This type of extension work covers not only the farmers, but also the processing industries and commerce, as well as consumer education. The latter is of particular significance in the large cities. In 1946, special legislation entrusted this task to the extension services. In the Netherlands, where agricultural cooperatives are relatively more developed, agricultural extension has no direct task in this field, although closer contact between the extension services and these organizations would appear desirable.

Extension work in backward agricultural areas is given special attention in both the United States and the Netherlands. We can even observe a striking analogy in chronology and structure. In both countries the gap between the most advanced farms and agricultural regions and the more backward ones is continually widening. Supported by a special law of 1955, schemes of regional development were launched in the United States by means of particularly intensive systematic and integrated extension programmes. At present there are 200 pilot counties in 30 States. In the Netherlands, too, pilot areas have been started since 1956, two-thirds of which coincide with land consolidation schemes: as a result, there is intensive, systematic, more or less integrated extension work which takes into account aspects of agriculture as such, home economics, and socio-agrarian aspects. At the moment there are about 100 such pilot areas distributed over all provinces comprising one-seventh of the entire land under cultivation.

Working Procedures in Extension

In the United States, the population, because of the structure of the extension services, exerts great influence both individually and collectively upon the objectives of rural extension, more so than do the people in the Netherlands. This collective influence makes itself felt through the local and regional committees which establish the extension programme. In agricultural as well as in home economics extension, the farmer or the farmer's wife will in the first instance determine what he or she wants to achieve. The extension worker, however, puts before the person advised wider possibilities of choice by pointing to various alternatives. Farm and household analyses and alternative budgets are used for this purpose. Here we see an analogy with the working methods of socio-agricultural extension in the Netherlands. Dutch agricultural extension is more 'instructive' in its method, although we see a growing emphasis in farm management extension on the elaboration of alternatives from which the farmer must make a choice himself.

Extension services in America have chiefly relied on mass methods promoted by the so-called information service. The intensive use of television, radio, and the written word has been stimulated by the large distances between the various farms. Although radio maintains its role, television lends itself very well to the propagation of work simplification, consumer education, and 'public relations' for agriculture. During the past ten years the conviction gained ground in the United States that these mass methods become less effective as managerial problems gradually increase and become more complicated. The extension staff was therefore expanded to implement the farm-and-home development plan embodying group and individual methods in extension as well as visits to the farms. In the Netherlands we can, to some extent, observe the reverse of this development. Mass methods developed in the post-war period later than the individual and group methods of the relatively intensive extension services. It is necessary to continually seek the optimum balance in applied methodology. This differs from region to region and according to the educational level of the agricultural population and the subject requiring priority.

A very important part of American extension work is the use of local leaders, male and female. Volunteers are given special training and responsibilities for work which they carry out free of charge. If the work of these local leaders, who number almost 100 times the professional extension workers, were to be expressed in money according to current rates, the resulting total would be of the same order of magnitude as the amount spent on the entire extension services.

In the United States, extension has been based for some time past on a programme established, in the first instance, by local extension committees, taking into account the priorities in extension. The annual plan of work of the extension services is largely established by the services themselves. The extension programme on the State level chiefly comprises a compilation of the county programmes, into which is integrated activities considered to be urgent by the State and federal extension staff. Programme experts are active on both the regional and State levels. Programming as a whole was not sufficiently efficient in the past, since it tried to please everybody. The report of a national commission enumerated some major points to which the extension services should devote their attention. On the basis of this report, the individual States now establish regionally adapted, more specific programmes, which finally give rise to the more detailed local programmes. As a consequence we can observe a systematic interrelation from the local to the State and federal levels and vice versa. Programming has acquired a sounder foundation, since it is based on situational analyses of agriculture and rural areas. This time-consuming fundamental programming is carried out only periodically in so-called 'programme-projection'.

In the Netherlands, extension programmes in the past have been established for agriculture by the extension services. But in 1961, a new general programming procedure for the entire field of agricultural extension was introduced on the basis of general directives laid down by the national agricultural extension council. Its implementation in national, provincial, and regional programmes constitutes a concerted effort of the agricultural extension councils in which the national extension service and farmers' and agricultural workers' organizations are represented. The extension services will carry out the preliminary research aimed at indicating the extension subjects to be attributed priority.

Evaluation of extension has been carried out in the United States for quite some time, both from the public relations aspect and from that of improving the extension activity. The second type of evaluation still frequently comprises only statistical reports on extension activities such as number of visits, meetings, etc. Evaluation of the actual effect of extension is still at the stage of preliminary research. In the Netherlands too this evaluation is still in its infancy.

Government Intervention in Agriculture and Rural Areas

In 1961 the budget of the Department of Agriculture in the U.S.A. amounted to almost 7% of the total federal budget. About two-thirds of this amount is spent on direct measures regulating prices and incomes and the remainder on agricultural education, research, and extension. The proportions are approximately the same for the Netherlands Ministry of Agriculture, but it supplies almost the entire costs of agricultural education, research, and extension, whereas the U.S. Department of Agriculture's contribution to this field is only one-third of the amount spent on it, the other two-thirds being provided by State and local sources.

The Comparative Development of Extension Services within Europe

Although the term 'advisory service' is commonly used in European countries, 'extension service' is more comprehensive and more widely known internationally.

Structural Forms of the Extension Services

The different European extension services arose at different times and in different ways. In some countries the origins go back for a whole century, while others are very recent. The varied origins and, subsequently, economic and social conditions have given rise to the present range of extension structures.

There are three main types of structural form of extension, depending on the organization directing it, namely the agricultural universities, agricultural organizations, and the central or regional government authorities. There is also a transitional form between the last two.

The only European example of the first organizational form is found in Scotland, where the agricultural extension service comes under the control of the three agricultural universities, a situation identical with that in the United States. The extension services are now wholly supported by the government. The structural link between extension, research, and education at the academic level is thus assured. Denmark constitutes the classic example of the second form. Agricultural organizations employ their own extension officers. At present the government contributes one-third of the total cost of the advisory services. The Danish system has the undoubted advantage of automatic intensive contact of the farmers with the extension service for which they are paying. But the services may be too strongly localized and there is need for national coordination, especially in regard to in-service training of staff and rationalization of activities — at prese different organizations may operate independent extension services within the one area. The third type of structural form is found in the Netherlands, England, France, Greece, and Turkey, for example. In all these countries the services are directed by a central authority. In Norway, Austria, Sweden, Germany, and Switzerland, the provincial semi-governmental authorities have a more major role, and in many cases there is felt to be a growing need for more central coordination of extension.

The Relationship between Extension, Vocational Teaching, and Research

In Germany and Switzerland, there is a close organizational link between extension and vocational teaching in that the directors of the so-called agricultural winter schools are at the same time heads of the extension services for the areas covered by the schools. In no country do we find vocational teaching in agriculture as intensive and differentiated for the various levels as we do in the Netherlands, where it is considered to be the indispensable prerequisite of efficient extension.

The intensity of the extension services is increasing in many European countries. This is particularly pronounced in France, Italy, and Greece. The Netherlands, Scotland, Denmark, and Germany already have relatively intensive extension services. Although the Netherlands has the most intensive extension services, the money spent on them is less than 0·5% of the gross value of the yearly agricultural production and is less than 2% even when lumped together with vocational teaching and research in agriculture.

The Educational Level and Training of Extension Staff

Most European countries employ chiefly academically trained personnel in agricultural extension. But the Netherlands, Sweden, Germany, France, and Italy also employ non-academically trained extension officers. There is a tendency to use the latter as generalists at the local level, whereas the specialized extension officers at the regional and national levels are academically trained.

The rapid development of agricultural economic and social sciences and techniques, mechanization, integration of agriculture, competition for markets, and the rising educational level of the farming population have all contributed to a greater demand for advice. This has not only widened quantitatively but deepened qualitatively. Hence the quality, and consequently the training, of the extension staff in European countries is of increasing importance.

There is no substitute for quality in professional extension workers; it is, to some extent, more important than their number. An extension worker is more than an expert in a certain field. His training should also prepare him to be a community organizer, an adult-educator, a student of human behaviour in general, and a pioneering guide for a changing agriculture, closely interrelated with the varying and ever-changing conditions of rural life. Suitable staff must be recruited, trained, and retained. Personality and the morale factors of status, facilities, and career prospects are decisive for effective extension work.

It has become recognized that those primarily responsible for carrying out extension work should be university graduates. But most extension workers come into the service as technicians rather than educators. Fundamental training in subjects like farm economics, rural sociology, and extension methodology is often completely lacking or inadequate. It is becoming recognized that extension should be made a subject for special systematic study within the university. At present there are only a few university chairs in extension in Europe, established in the post-war years. A post-graduate course could substitute for induction training to a great extent. But it goes without saying that in-service training of extension personnel at all levels throughout their careers remains of particular importance.

Scope of the Extension Services

The differences in the scope of extension work between the European countries and the United States are becoming less pronounced. But at present organized and coordinated extension work in rural home economics, rural youth development, marketing, and consumer education is provided to a much lesser degree by the European rural extension services. There is a gradual increase in extension emphasis on decreasing production costs, increasing product quality, increasing labour productivity, and the use of farm management extension techniques.

Working Procedures in Extension

As agricultural extension in Europe is gradually more orientated towards farm management, in which financing, work simplification, and marketing are given additional attention, the extension approach is becoming less instructional and more educational. Thus it grows gradually from prescriptions to alternatives laid down for the cooperating farmers.

An example of the attempt to intensify group extension is the great progress in northern Germany of the so-called 'advisory circles'. Some 50 members employ an extension worker who deals with farm planning extension problems of the members. The German federal and provincial authorities and 'circle' members share the cost, paying 40%, 30%, and 30% respectively. In France, a type of farm study group organization has developed with very limited membership, i.e. 10 to 15. These are usually owners of large farms who themselves pay for the services of an extension worker. These examples contrast with the agricultural extension associations in the Netherlands, where the contributions levied are relatively low and the number of members is too great to allow 'farm planning' extension for their benefit.

Greece has remained the only European country where comprehensive programme planning in rural extension (comprising agriculture and home economics) is carried out for the entire country more or less according to the example of the United States. General programme planning in rural extension — which for the major part still consists of agricultural extension only — was started in the Netherlands in 1961 on a trial basis.

The problem of less developed rural areas in Europe has been attracting increasing attention in recent years as the gap between these and more advanced regions appears to be widening both at the national and inter-European level. On the initiative of the Commission of the European Common Market, a preliminary survey was made of the rural areas of the six countries, with an agricultural population of 43 million and 7 million agricultural holdings. The rural areas were divided into 30 agricultural regions according to their relative prosperity as indicated by the production per inhabitant. The survey revealed a wide disparity between regions as the level of prosperity measured in this way ranged from 23 to 200, based on an average of 100. The Netherlands averaged 107 with variations from 89 to 130 in the different provinces.

An accelerated rate of application of extension to the development of backward agricultural areas has been noted in the different European countries in recent years. The pilot-area approach is showing remarkable development. It is realized more and more that the achievement of greater productivity in less developed areas is not primarily a matter of production techniques in agriculture. Land tenure reform, land consolidation, and rural socio-economics are receiving increasing attention. Finally there is increasing recognition of the validity of the extension principle that effective rural development measures cannot be planned and implemented by authorities without the full cooperation of the rural people concerned.

SOME PERTINENT POINTS

To sum up, the following points may be emphasized:

1. There is no substitute for quality in extension workers, taking into account the ever-expanding research and technology in addition to the fast structural changes confronting the agricultural industry and rural life. Therefore, any country must provide adequate professional training, working facilities, status, remuneration, and career prospects if it is to recruit and retain effective extension workers.
2. The 'whole-farm' approach, as a complement to the specialized approach, will be needed in the future. All-round extension workers trained in the whole-farm approach, with special reference to its socio-economic aspects, should work in close cooperation with the specialized extension workers in the various technical-economic aspects, taking into account the interrelationship between these different aspects in the ever-widening scope of rural extension, including rural home economics and rural youth work.
3. The participation of the rural population in the establishment and guidance of voluntary extension associations like advisory circles, farm management clubs, etc. should be stimulated in coordination with the official extension service. Private agricultural organizations, agencies, and societies should be included as far as possible in the basic extension procedure of programme building.
4. Extension research and basic extension training are still neglected fields of university activity in many countries. No one country or State has a monopoly of extension knowledge and ideas. The publication of systematic comparative extension studies is one way we can share this information to our mutual advantage.

PAPER 12

COMPARATIVE AGRICULTURAL EXTENSION

By R. N. FARQUHAR*

Comparative extension is, in effect, a research methodology which recognizes the various physical, biological, economic, political, cultural, and other social factors which are part of the historical environment of the two or more extension systems being compared. The methodology is based on the systematic study of the origins, developments, and interrelationships of the different systems of extension. This supplies a common basis for comparison of these systems.

Comparative studies help to distil common principles and concepts applicable to agricultural extension wherever and whenever it is practised. They are a further step in the development of extension as a reputable field of academic study in its own right. But the results of comparative extension studies are of more than academic interest. They produce a clearer understanding of the background and basis for the extension system of one's own country or State. They stimulate a critical approach and challenge to one's own philosophy. While change is the aim and end-product of extension, change in extension work itself is the aim of comparative extension studies.

CONCEPTS AND TERMINOLOGY IN AGRICULTURAL EXTENSION

The term 'extension education' was first introduced in 1873 by Cambridge University to describe a particular educational innovation. This was to take the educational advantages of the universities to the ordinary people, where they lived and worked. The term 'extension' was first coined in England, not in America as often thought.

Within a decade or so the movement had spread to other institutions in Britain, the United States, and elsewhere. It is of interest to find that the first grants to the extension movement from public funds, in this case from English county councils, were for extension lectures in agricultural science.

As the movement was taken up, its programmes became adapted to meet the needs of the people, the place, and the time. In England, the first major change followed the formation of the Workers' Educational Association in 1903. The latter virtually took over the university extension movement and adapted it to the now familiar W.E.A. tutorial-class type of extension education.

The American extension movement started, on the same basis as in England, from the universities and large public libraries. The first Director of Extension within the United States (University of Chicago, 1892) was an Englishman named Moulton. He had been one of Cambridge University's original extension workers and in 1885 had documented the first ten years of the extension movement — the world's first real treatise in extension. But, as with several other American adult education movements of the 19th century, popular enthusiasm waned almost as quickly as it had grown. There was some revival early in the next century, but it was largely by its agricultural and rural home programmes that extension made its major impact in the United States.

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Agricultural extension, as we now know it, developed much later than the other extension programmes. But its origins in agricultural education, advice, and demonstration are as old as agriculture itself. And the sources of information and ideas include many countries. The student of comparative extension finds that most of the apparently indigenous national programmes are syntheses of international ideas adapted to meet the local situation.

The Scottish Advisory Service is one of the oldest agricultural extension services in the world. It was established around the turn of this century virtually in its present form as a cooperative county-agricultural college-national programme. Concurrent agricultural education and advisory movements developed in England, continental Europe, and elsewhere, including Australia. For example, as early as 1889 Queensland started a successful dairy extension programme based on the use of two 'mobile dairy extension units' (trains). From this innovation and from its description as 'extension', it is apparent that local thinking was at least abreast of the then professional development.

The United States and Canadian development resulted from a complex of local ideas, mutual influences, and trans-Atlantic exchanges. The university extension of England led to the isolated agricultural extension work of the U.S. Land-Grant Colleges. The Farmers' Institute movement originated in the northeastern United States. The Women's Institute was adopted by the United States and the United Kingdom from Canada. Dr. Seaman Knapp's 'Farm and Home Demonstration' programme started in southern U.S.A. in 1902. It was sponsored and originally financed by the U.S. Department of Agriculture as a national effort to rehabilitate the cotton-growing areas. Later, State and local government finance and participation were added and it became a cooperative project. The 'County Demonstration Agent' system was inaugurated concurrently with the appointment of the first six district 'Agricultural Representatives' by the province of Ontario in 1907.

It should be noted that the term 'extension' was not used in connection with most of these early European and North American programmes. The term 'agricultural extension' was not finally adopted until the U.S. federal Smith-Lever Act of 1914 formalized a nation-wide cooperative federal-State-county programme, and gave operational responsibility for this to the Land-Grant Colleges and Universities. The present pattern of American agricultural extension resulted from this merger of a major national agricultural rehabilitation programme, plus some farmer and local adult education movements, with 'university extension'. However, it soon became such a large and vital programme that the use of the term 'extension' tended to be restricted to agricultural and home demonstrations.

The concurrent developments in Australia and elsewhere were based primarily on the appointment of 'inspectors', 'specialists', and 'experts' who had some advisory functions. From these, groups, branches, and eventually subject-matter divisions evolved, with gradual decentralization of staff responsible for investigation, regulation, and extension. This was in sharp contrast to the North American developments which were based from the start on decentralized general practitioners serviced by State and regional specialists.

With the tremendous development of rural extension work in the United States in the following four decades, the term 'extension', and some of the know-how associated with this work, was again exported — this time from the United States and in further modified form. It should be noted that the original educational content and philosophy of 'university extension' remained in the agricultural and home demonstration extension programmes of the United States. This educational content and philosophy, and a wider concept of rural extension as a method of assisting the development of farmers and farm families as well as of farms and farm production, was also exported. The present 'importing' countries include the United Kingdom — from where the philosophy, term, and practice of extension originally came. The numerous changes in extension implemented in Europe in the post-war period reflect the strong American influence.

A further major modification should be noted. There is a definite trend, particularly in the United States and Canada, and most pronounced in the 'newly developing' countries of Asia and elsewhere, either for agricultural extension to broaden its subject-matter base to include a wider range of subjects or for agricultural extension to be closely integrated into a much wider programme of 'extension' or 'community development'. For instance the four regional directors of extension in Utah are now responsible for all aspects of extension and adult education activities, including the agriculture and home demonstration programmes. The Territory of Papua and New Guinea has a Department of Information and Extension Services which has a broad 'community development' approach and aims at coordinating and integrating extension activities in agriculture, health, local government, etc., somewhat on the lines of the huge 'community development' programmes of India and elsewhere.

Detailed studies of how, when, where, and why our present extension programmes came into being, some aspects of which have been briefly summarized above, led the author to the formulation of some broad operational definitions.

Extension, in its broad sense, may be defined as:

> 'The extending of, or a service or system which extends, the educational advantages of an institution to persons unable to avail themselves of them in a normal manner.'

In other words, all forms of extension take education to the people. By definition, 'extension' and 'extension education' are synonymous. 'Agricultural extension' takes to the rural people that form of educational assistance best suited to their needs.

The author's definition of agricultural extension is:

> 'A service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural life.'

The above definition is quite broad. It includes the whole environment in which a farmer lives and operates as a legitimate field for extension activity. It recognizes that standards are usually different from levels of achievement. It is not restricted to farmer-contact work, but includes extension research, training, liaison, and information work as integral parts of the agricultural extension system.

It was in Europe that the author finally faced up to the hotly contested, values-weighted question of the difference, if any, between agricultural extension and agricultural advisory work. Investigations showed that, usually, the title in itself meant little. Often it was merely 'a rose by another name'.

In the opinion of the author, whatever difference there is depends on the philosophies and attitudes of the extension or advisory workers themselves, and on the objectives of their organizations. If the approach is to supply information and help to farmers in such a way as to make them dependent on continuing advice, the work is advisory work. Where the farmers are educated on how to tackle their problems, where to get information, etc., and the philosophy of the adviser is to 'work himself out of a job' (which, of course, he does not achieve in practice), then the work is truly educational and is definitely extension. This type of differentiation is now being recognized by many extension leaders throughout the world. But the fact remains that, for the present, the title of a service does not necessarily nominate whether or not it is solely or partly engaged in 'extension' work in the true sense of that word.

Agricultural Extension in the United Kingdom

There are several different types of agricultural extension organizations within the United Kingdom.

In England and Wales, up to 1939 the universities and agricultural colleges operated regional specialist services and the counties separately operated the general advisory services. These services varied considerably in their intensity and efficiency. The wartime period of 1939–45 brought complete mobilization of national resources, including agencies concerned with agricultural production.

In 1946 the National Agricultural Advisory Service was formed. This reorganization was based on recognition of the following weaknesses in the pre-war system: lack of uniformity in the type of service supplied due to lack of central coordination, poor opportunities for advancement and general staff inadequacies, and lack of effective coordination between university-based specialist services and county-based advisory services. The Luxmore Committee report of 1943 was largely responsible for the formation of the new national organization. One important recommendation not adopted was to place all agricultural education and advisory work under the management of a National Council for Agricultural Education. Instead the N.A.A.S. became part of the Ministry of Agriculture and Fisheries, and other agricultural education activities remained a responsibility of the local education authorities. The Women's Institute and Junior Farmers' movements remained individually autonomous. By contrast, the equivalent American movements are integral parts of the cooperative extension service.

On a common statistical basis, there are about 300,000 farms in England and Wales, compared to about 250,000 for Australia. Available evidence suggests that the ratio of 'full-time equivalent' extension officers to total farms is somewhat comparable for Australia and England and Wales. But it is difficult to get any two organizations to agree on a common basis for defining 'full-time equivalent' extension workers and quoted figures need careful assessment in comparative work. Then the area of farms, their economic size, rural farm population, stage of development of agricultural industries, and physical communications facilities are some of the variables affecting the validity of such comparisons.

One point deserves emphasis at this stage. A figure of, say, 250 farmers per extension-worker equivalent may be quoted. This should not be taken to mean that this is the situation from the farmers' point of view, as in the N.A.A.S. the ratio of specialists to district staff is about two to one.

The N.A.A.S. organization is based on about 400 'general practitioner' District Officers and Assistants serviced by specialists and supported by the District Committees of the County Agricultural Committees. The farmer committee members often personally assist in farmer-contact work, in district surveys, and in the organization of extension meetings.

The county is the next unit in the organization, with a County Agricultural Officer responsible for the work of several District Officers. Some 'husbandry' extension specialists are based at the county level. These may include the horticultural, dairy, pig, sheep, and other animal and crop husbandry specialist extension workers. The County Agricultural Officer coordinates their work.

The 'region' is the next unit. The Regional Director is responsible for about 150 to 200 professional staff. The majority of the 400 husbandry specialists, all the 300 to 400 science specialists (chemists, pathologists, etc. investigating local problems), and experimental farm and laboratory staff are based at the regional level. The regions are the main centres for the administrative staff. The national headquarters carries a very small staff. The regions are relatively autonomous, but there is a division of control which may restrict the Regional Director. He has the power only to recommend expenditure. Approval for this rests with a senior administrative officer stationed at regional headquarters.

The author was impressed by the effective servicing of the district officers by the specialists. The specialists worked with and through the district officers and did not develop independent specialist extension services. There appeared a tendency for the larger, labour-employing farmers for whom management was a specialized function to demand the services of the specialist, including the farm management specialist, while the family-sized-farm operator welcomed the visit of the District Officer.

Extension methods, such as farm visits, field days, meetings, etc. appeared very similar to Australian methods. But all the District Officers had the whole-farm approach and more training in farm management economics than is usual in the mainland Australian States. The Tasmanian extension worker would not be so well trained, formally, in that work, but in practice would be similar. However, the servicing of the N.A.A.S. extension workers by the specialists with farm-management research information and training appeared to have no parallel in any Australian State. Each of the eight regions has a university which cooperates with the specialist branches and also supplies all agricultural economic research and training services for the staff of the region.

It was interesting to see the extent to which the N.A.A.S. was studying other extension systems, particularly the American and Canadian systems, and to see the marked progress from a technical advisory service, to a farm-management advisory service, to the early stages of the rural socio-economic approach typical of American agricultural extension. Another deliberate trend was to remove all 'executive work' from extension personnel and leave the latter with only educational and advisory work. ('Executive work' included licensing of breeding animals, dairy inspections, seed certification, and inspections under plant health regulations.) As research was the responsibility of other institutions, research–extension liaison was a major problem for the N.A.A.S.

The first university professional training courses in agricultural extension were given in 1961 at Cambridge University—about 90 years after it pioneered 'university extension'. But there appeared to be indecision in the N.A.A.S. as to what professional extension training (if any), except subject-matter training, was needed. The universities were not active in extension research and did not supply professional leadership as in the United States.

Several differences between the N.A.A.S. and the Scottish Advisory Service were noted. The latter was operated through and by the three regional agricultural colleges in cooperation with the Scottish Department of Agriculture and local advisory committees. No 'executive' (i.e. regulatory) work was done by the advisory services. The role of women as specialists in extension, especially in horticulture, dairying, poultry-farming, and beekeeping, was much more pronounced than south of the border. The author gathered the impression that the Scots were tending to look to the N.A.A.S. for professional leadership and training of senior officers and specialists, as the latter developed into a more professionally mature organization. Research, from the basic to farm application stages, was the responsibility of the independent Research Institutes. These cooperated fairly closely with the Advisory Service, but effective research–extension liaison was nominated as quite a problem.

The major lessons for an Australian to learn from the United Kingdom appeared to be the following:

1. The general practitioner District Officer was the operational base for the entire organization;
2. The servicing of district extension men by specialists was quite intense;
3. The specialists worked with and through the district extension men and did not develop independent specialist extension services;
4. Research and training in farm management economics were much more highly developed than in Australia;
5. Farmer participation through active local committees was an important and growing part of British agricultural extension;
6. The whole-farm and farm management approach has encouraged the recognition of the socio-economic base of extension work.
7. There was little complacency amongst the British agricultural extension workers. Their attitude at all levels was one of standing off and looking at themselves. What were they really trying to do? What were their real aims

and objectives? Were they really using their present resources to the best advantage? How could they measure their extension efficiency? This 'soul-searching' attitude was particularly obvious among the leaders at the national and provincial levels.

Agricultural Extension in the United States

The United States Cooperative Agricultural and Home Demonstration Extension Service is the best known and most widely acclaimed agricultural extension organization in the world. But the American extension services still have many problems. Some of these problems are a reflection of the changing rural socio-economic environment in which extension now operates, and some of the problems have been accentuated due to the successes of extension in the past.

At the national level, there is but a small number of federal specialists and central staff. The philosophy of these is that it is the Land-Grant College, as the State-level partner, and the county authorities who are the real extension people. The federal office is there only to complement the other levels of work. However, in 1957 federal sources supplied about 50% of the $119 million total finance for the Cooperative Extension Service, despite the fact that the professional staff of the Federal Extension Service was only 106 persons, while State and county workers totalled over 14,000.

Further investigation shows that there is very considerable inactivity at the federal level. Extension research, extension training, and national extension programmes are some of the important products of the national office. For instance, it is doubtful if there would be sufficient interstate cooperation and activity to achieve the interstate regional workshops, conferences, training schools, etc. if it were not for the role of the federal office. As it is, the United States can, and does, have regional workshops for State Extension Directors, for subject-matter extension specialists, etc. with considerable stimulation at the leadership level. The evidence suggests that qualified extension research resources, limited even in a country the economic size of the United States, are used to best advantage by having a national affiliation.

The Land-Grant College combines some of the features of the Australian university, agricultural college, and Department of Agriculture. It is responsible for all the agricultural research and extension in its State. State Departments of Agriculture in U.S.A. are purely regulatory organizations. The Agricultural Research Service of the U.S.D.A. has a research role analogous to C.S.I.R.O. in Australia, in relation to State work, but has developed cooperative work to a higher degree than that achieved in Australia.

The College is the source of the subject-matter 'extension specialists' at the State level. These are usually faculty members with professorial titles and status. They may be part of their various subject-matter College Departments (such as Agronomy, Animal Nutrition, etc.) in which case there is a problem of coordination of the work of the extension specialists. An accepted concept is that maximum productivity from the extension specialist resources cannot be gained through their functioning independently. Or they may be members of the extension service (as in the N.A.A.S. in England) in which case there is a problem of keeping them with *entree* and some identification with their subject-matter departments in the College. Perhaps as important as any one other fact, the Land-Grant College has given status to agricultural extension workers.

The county-level organizations may hire and fire their own agents despite the fact that their contributions average now only about 20% of the extension budget. However, in practice, agent hiring, firing, training, and technical servicing are recognized as the province of the College in cooperation with the local organization. The local identification is strong. Locally, the extension service will not be known as the 'Federal Extension Service', nor, say, the 'New York Extension Service', but rather as the 'Tompkins County Extension Service', or whatever. In 1957, there were 10,845 graduate county-level professional extension workers in the United States.

Programme planning for the following year is an important local activity. Committees and specialized subcommittees of farmers work over the weeks, often meeting several nights a week. In practice, the amount of the final product which is truly the product of the farmers' efforts, and hence of that which represents the thoughts and plans of the county agent and State specialists, varies from county to county and depends to quite a degree on the personality of the agent. The county programmes are printed and distributed within the county and in the College.

However, whatever the cause, the effect invariably is that members of the local farmer committee, and often a large proportion of the farmer community, are personally identified with the extension programme for the ensuing twelve months. It is usual to have working committees to actively assist in the implementation of particular phases of the extension programme and to take part in the programme evaluation. In some enthusiastic and well organized counties, up to 70% of the work for the formal extension programmes is done by the local committeemen. The local county agent staff in such a county are busy in the background, guiding the direction of the activity, encouraging efforts, and sometimes tactfully modifying over-enthusiasms. Extension research specialists advise or assist in the evaluation of the results achieved by the programmes.

In activities such as these, the agents' training in educational psychology and sociology, etc. is very helpful. But back of it all there is, usually, a sound rural background, a four-year degree course which has many of the advantages of both our university and college courses for extension workers, and the solid backing of specialists and colleagues. In trying to accent the importance of the social sciences in American extension training and work, often insufficient stress is placed on the fact that the American county agent is technically well trained and serviced.

Where there are family-sized farms, the farmer-contact extension man must still have the whole-farm and farm-management approach. But farmers over all the more developed States of America are now demanding a higher standard of technical knowledge as well as farm-management advice from the extension staff. This means that assistant agents often must have some specialized post-graduate training in a particular industry. These men are still general practitioners with the whole-farm and farm-family approach, but they are dealing with a clientele who have specialized their production to a higher degree than in the past.

The urbanization and the social and educational advancement of many rural areas, plus a realization that farmers must look far beyond agricultural production alone, have meant an increasing demand on the extension service to develop extension programmes in marketing, distribution, and utilization, in efficiency rather than quantity in production, in community improvement, and in public affairs. This involves more extension specialists in these fields, training and servicing the extension workers, and re-allocating extension resources to include the new programmes. With this has grown the need for more top-level assistants to the College Extension Directors to cope adequately with the growing administrative, programme, and public relations responsibilities.

The major lessons for an Australian to learn from the United States appear to be:

1. A higher degree of local participation and control in extension work, particularly in the formulation, implementation, and evaluation of local extension programmes, may achieve a higher degree of farmer identification with (and hence acceptance of) extension recommendations.
2. Interstate cooperation and coordination in extension research, extension training, and national extension programming is a more efficient use of limited resources than independent and often unnecessarily duplicated activities by individual States.
3. Federal participation is one way of achieving this increased interstate cooperation, but American experience has shown that increased federal participation and finance does not necessarily mean federal control. Cooperative agreements, periodically reviewed and frankly discussed, can ensure this.
4. Extension should rely on the support of research into extension methods.
5. Extension workers need training in adult education and the rural social sciences, particularly economics and rural sociology, as much as they do in the physical and biological sciences applied to agriculture.
6. Extension should have the 'problem approach' rather than the 'speciality approach'. This means that it is inefficient for extension specialists to operate independently. The general practitioner is the logical end point for such specialist coordination.

AGRICULTURAL EXTENSION IN AUSTRALIA

Some Pertinent Questions

Does Australia need a philosophy of extension? What are extension's real aims and ultimate objectives? What are the principles of extension? One of the earliest Australian attempts to define a philosophy was published in 1929 by the then Tasmanian Director of Agriculture:

> 'To make two blades of grass grow where one grew before is a worthy enterprise but the objectives of the Department of Agriculture are much wider than this.

> When the resuscitation of the agricultural industry of Tasmania was seriously attempted about two years ago, the aim was at least two-fold: firstly, to increase the wealth of the community, and secondly, to improve the social and educational standards of rural life, so that those engaged in it would receive their deserved measure of stability and prosperity.'

Australia has all types of extension organization, from full reliance on subject-matter specialists for farmer-contact work, to extension as a special division with a general practitioner extension worker base. The former has the problem of integration of subject matter into farm-management programmes, while the latter has the effective servicing of the general practitioners by specialists as a special problem. Participation in extension at national and local levels is much less than in many overseas countries. The O.E.E.C. report on European advisory services in 1950 recommended a 'general adviser' base, supported by specialists. If we were to start with a clean slate, what type of organization would we build?

What type of person do we want as our extension worker? What training should he be given, at both the undergraduate and post-graduate (or diplomate) levels? South Africa's present policy is to give all extension workers three years field experience and then twelve months graduate university training in extension. Is this practicable in Australia?

What sort of professional career opportunities should be provided for extension workers?

To what degree can research in the social sciences support extension work?

Extension programme planning is time consuming. Is it a practicable base for extension operations? To what degree should farmers and farmers' organizations be involved in extension programme planning and implementation? Are extension evaluation studies worthwhile?

What form of research–extension liaison is the most efficient? What further local work and information is needed before research results can be included in local extension programmes?

The above are some of the questions of great concern to extension leaders in overseas countries. They are very pertinent questions for the Australian Agricultural Extension Conference, 1962.

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(*Note*: The above theses contain bibliographies listing the 111 original references used.)

PAPER 17

EXTENSION WORK WITH RURAL WOMEN

By NANCY M. FOSKETT*

Extension service for rural women is complementary to the agricultural extension service; essential to an agricultural service that recognizes a farm as not only a farmer and a farm enterprise, but a farm home, wife, and family — a way of living as well as a way of earning a living.

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* Department of Agriculture, New South Wales.

Advisory services for country women commenced in Europe early this century, after rural home economy teaching centres (where agricultural and domestic subjects are taught) were established. About the same time the need was recognized in U.S.A., Canada, and New Zealand. Now, services are developing in many Asian, African, South and Central American countries, and the Pacific Islands. Intensity of service is varied: as recently as 1955 the staff : clientele ratio was one adviser to 6,000 farms in the Netherlands, one to 10,000 in Germany, one to 1,300 in U.S.A., and one to 2,000 in Denmark.

In backward countries, with poor agriculture, the extension service has indeed frequently started as an extension service for the womenfolk and home.

Purposes

The general purpose is to inform rural women of scientific and technological developments as they affect the home and family to advise their adoption; to improve the health, comfort, happiness, and working efficiency of farm people; and to counsel on problems raised by rural women.

An extension service to rural women may develop an awareness of science in a home. A farmer's wife, aware and appreciative of what extension service has for her, is the more likely to be a positive influence on farmer and family to find out what extension has for them; more likely to become the 'engineer' of extension effectiveness on the farm, a keen supporter and sometimes the instigator of change. Decisions affecting farm and home improvements are likely to be more advantageous when both the wife and the farmer are exposed to extension components geared to the needs of the family and the home as well as the farm. Through a knowledge of the advantages of improvements that would directly benefit her household, a farmer's wife is likely to encourage the farmer to adopt, more quickly, farm changes that have the capacity to increase farm income (and amenity purchase-power). Inertia due to apathy, quite commonly inertia due to contentment with the *status quo*, is one of the barriers to change in farm practices. The home may offer the break-through point.

Authorities Responsible

Types of organization and programme to meet the foregoing purposes and opportunities vary: they depend on the assessed and stated needs of the women, and the policy of the country. Most are wholly or in part the responsibility of the agricultural authority. Other authorities cooperate: education, food, health and welfare, universities, and others. Exceptions are seen in England and Wales. There is no established women's service in association with the National Agricultural Advisory Services there. And in Sweden, Norway, and Denmark, the advisers are independent of the agricultural authority. In some countries, community organizations (agricultural cooperatives, for example) contribute part of the cost.

Staff Training for the Work.—Home economics (home science) and agriculture are the most general training disciplines for a women's extension officer; but other qualifications (social work or interior decorating, for example) are an obvious asset to the extension team, and if not in the pre-service training are acquired in-service.

Operational Methods.—Most services work through voluntary rural women's groups. Training of local leaders at village or club level, to supplement the extension staff, is an accepted role in most cases. Information is disseminated in homes; at meetings, exhibitions, short schools, or courses; by mail, leaflets and publications, press, and radio. Mobile services and communal installations (food preserving centres, for example) are components in some countries.

England and Wales.—The National Agricultural Advisory Services of England and Wales do not include an extension service for rural women; but population density and shorter distances make possible the rural women's participation in many advisory services from other bodies. Among these is the Rural Domestic Economy Service. It is part of the Education Ministry's programme for further education through the Local Education Authorities of the County Councils. In many counties the Service works closely with the County Farm Institutes (farmer and farm-worker training centres).

In addition, a number of organizations (manufacturers and service industries) have educational programmes. Their lecturers and demonstrators are available to women's groups.

U.S.A.—The service for rural women in U.S.A., is known as Home Demonstration Work. It is part of the programme of Cooperative Extension Service in Agriculture and Home Economics, financed by the U.S.D.A., State Governments, and Counties and centred in the State's University or Land-Grant College. Home demonstration work is organized much as the agricultural extension, but the home demonstration agents work more directly with organized groups. The programmes come from discussion and cooperation between all levels, from club member to State Supervisor.

Rural Women's Extension in New South Wales

The New South Wales Department of Agriculture recognized a place for a Rural Women's Extension Service as far back as 1927. In that year a professional woman was appointed (designated 'Women's Organizer, Agricultural Bureau of New South Wales') to assist the State Organizer of the Agricultural Bureau. This is the farm organization sponsored by the Department as an extension aid. Almost 20 years later the position was redesignated to 'Senior Extension Officer (Women's Service)'.

In 1961 the number of staff of the Women's Extension Service was increased from one to three. The two additional officers are designated 'Extension Officer (Women's Service)'. This staff is within the establishment of the Department's Division of Information Services, as is the organizing staff of the Agricultural Bureau. The staff of three is in marked contrast to, for example, the thousands of Home Demonstration Agents in U.S.A. (one to 1,300 farms) or even the seventy or so in the post-war Philippines.

Our service to rural women and families works mainly through rural organizations. In particular it works closely with the Agricultural Bureau of New South Wales; but also through the Country Women's Association of New South Wales, community groups, and, on occasions, the special branches of primary industry organizations at meetings, field days, conventions, schools, and courses. Field days at Departmental Research Stations and Experiment Farms also provide chances to programme sessions for rural women. Information is provided on farm home and family topics in answer to rural women's felt and known needs, interests, and problems. Requests for lectures and demonstrations on specific topics have been pointers to needs. Other guides to subject matter are individual enquiries, planned discussions with associate members of the Agricultural Bureau, and the officers' own awareness of new or topical developments.

Besides personal participation in the teaching programmes, an important part of the work of the three officers in New South Wales is to advise agricultural extension officers, Agricultural Bureau branches, and other organizations seeking suggestions, on subject matter and sources of speakers and demonstrators for women's sessions at functions.

Articles for the Department's weekly sheet of Press Copy, and talks tape-recorded for use in farm radio sessions of the field officers of the Department, are prominent in the service. Personal mail and 'phone enquiries are handled, and much of this demand comes from the press and radio material.

Short courses and schools are organized, and staffed in part, by the Service.

Resources

The number of sessions, arranged by the Service but conducted by other lecturers or demonstrators, greatly exceeds the number contributed by the officers. Good liaison with other organizations and individuals has made this possible.

The lecturers and demonstrators drawn upon include officers of the Department of Agriculture and other Government Departments; related service organizations — New South Wales Bush Nursing Association, District Ambulance Services, Country Women's Association, and others; consultants and advisers from manufacturing firms, retail stores, and utility companies — including gas and electricity supply authorities; industry associations — Illumination Engineering Society, Plastics Institute, and others; people in the various professions; and individuals, men and women, with special interests and abilities.

Achievements

Indications of success are:

Many Bureau branches that cater for home and family interests are in consequence stronger and more active

Attendance at field days and conventions has been improved by inclusion of women's sessions — voluntary field day organizers and Department of Agriculture officers now make special efforts to include women's sessions in programmes because, besides believing in the direct value, their experience is that male attendance is increased thereby

An obvious increase in awareness of needs, as the Service and its resources have taken effect

Better definition of requests from the women themselves for particular topics and demonstrations — today women ask for specific, rather than general, topics

Increasing independence of women in seeking and finding appropriate speakers and demonstrators

Greater balance between requests for 'skill' topics and those of a more technical and scientific nature — currently about one-fifth of the topics requested deal with skills

A greater awareness and knowledge of the Department of Agriculture

More Departmental officers aware of some of the direct and indirect advantages of an extension service to rural women

An evaluation of the Women's Extension Service of the New South Wales Department of Agriculture might be that, whereas it has captured widespread attention and interest, aroused desire for change, and caused some individuals to take action, it has probably fallen short of assured action by most of those farm households where progress would be most desirable. That short-coming could best be met by appointment of regional and/or district advisers; each able to devote enough time to close contact with farm families to become the personal friend and confidante of those families.

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SECTION III A

Special Problems of Extension in Pastoral and Other Industries

LIST OF PAPERS

PAPER NO.

20. Special Problems of Extension in the Pastoral Industries. *By* R. S. Stranger.
21. Problems of Extension in the Beef Pastoral Industry in Queensland. *By* W. F. Mawson and D. N. Sutherland.
22. Special Problems of Extension in the Sheep and Wool Industry. *By* P. G. Hyland.
23. The Extension of Epidemiological Information in the Control of Parasitic Diseases of Sheep. *By* H. McL. Gordon.
24. Special Problems of Extension in the Dairying Industry. *By* K. M. Sillcock.
25. Special Problems of Providing an Extension Service to the Pig Industry. *By* L. A. Downey.

25*a*. The Work and Methods of a District Poultry Adviser with Special Reference to the Economic Results Achieved. *By* H. V. Chamberlain and R. B. Fuge.

26. Factors in the Establishment of a New Horticultural Industry in a District. *By* E. P. Williams.
27. Department of Agriculture and Banana Growers' Federation Cooperation in Services to the Banana Industry. *By* H. J. Cann.
28. Improving Irrigation and Drainage Practices in Vineyards. *By* R. T. J. Webber.
29. Barley Harvest Damage Programme in South Australia. *By* F. B. Pearson.
30. Special Problems of Extension in the Grain Industry of the Darling Downs, Queensland. *By* J. Hart.
31. Rabbit Control — A New Approach Needed to an Old Problem. *By* B. V. Fennessy.
32. Extension and the Research Worker in the Northern Part of the Western Division of New South Wales. *By* R. D. B. Whalley.
33. Extension Services in the Arid-Scrub Zone of Western Australia. *By* D. G. Wilcox.
34. Special Problems of Extension in the Northern Territory. *By* N.T. Administration.
35. Italian Extension Liaison Officer. *By* G. A. Crawford.
36. Some Problems Associated with Field Assistance to Immigrant Farmers. *By* T. Abell.

REVIEW

By A. J. VASEY*

It is my privilege to invite your attention to the papers listed for this session. I propose to deal with them in groups, according to their subject matter.

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* Secretary, Animal Production Committee.

Problems in Industries Based on Permanent Grasslands of Low Productivity

This group comprises papers 20, 21, 23, 31, 32, 33, and 34. It brings together very conveniently those papers covering extension services to the pastoral industries, which are of immediate concern to the A.P.C., whose representative I am.

I am indebted to Bruce Levy (1) for this heading and also for the statement of the policy underlying the management of such grassland, namely,

> One that utilizes discreetly what nature provides for little or nothing.

This statement fairly covers the areas of extension information likely to be useful or worthwhile for these industries and to an extent indicates the extension methods to be followed.

The extension aims should be to define discretion as applied to the utilization of the various pasture associations of the properties, to adjust animal management to the seasonal grazing pressures thus permitted, and to select within the animal populations for the most productive strains on their performance within these restrictions. Perhaps Mr. Chairman there may be some discussion as to whether this generalization is acceptable and, if so, how far we have gone along these lines.

Regarding extension methods and planning, my heading for this group indicates that we are dealing with a very scattered if not a pastoral population in the biblical sense, with immense distances between the managerial units. Under such circumstances it is doubtful if a service directed primarily at the innovators and early adopters (2) is appropriate; probably each unit deserves individual attention, but for far-reaching decisions to be taken and implemented may not require more frequent visiting than once every two years; even nature seems to hasten slowly in the semi-arid environments.

What have our colleagues to say in their papers, taking them in numerical order?

It must be disheartening to find (paper 20) when you do manage to visit a property that you are not in contact with the decision-maker; an additional service is required by your head office colleagues to the head office of the pastoral company concerned. Use of aircraft in my view may be more appropriate for stock inspectors than agronomists.

Paper 21 gives the philosophy behind the establishment and operation of the Queensland beef industry extension service, easily the largest in Australia, the first of many references to the importance of field trials on private properties as an important cooperative venture and as a means of establishing the reputation or status of the officer with an innovator, and the value and success of schools as a group method, altogether a classic example of what can be achieved in even so short a space as 10 years.

Paper 23 applies the military concepts of tactics and strategy to a particular phase of extension and gives further evidence of the importance of field trials as a contact mechanism and a source of information.

Paper 31 describes and urges a change from the inspectorial to the extension approach in vermin destruction and stresses the importance of the innovator groups.

Paper 32 presents the case for an extension service to a pastoral zone by a group of subject specialists working from a research station on the edge of the area.

Paper 33 presents an interesting case study, in which I think the value of service in one pastoral environment is underestimated as a preparation for service in another, and raises the important sociological problem of residence in a small country town for the extension officer and his family.

Paper 34 describes the very difficult situation in the Northern Territory in regard to the attitude to new ideas. I feel it is impossible to overrate the importance of the film-screening suggestion; it should at least do much to alleviate the alleged tedium of the extension officer's visits (paper 20). Many of us with southern experience have doubts about the receptivity of farmers in the psychological atmosphere of the agricultural show; what would we say about a race meeting as an occasion for extension work?

I suggest the following for discussion as the major problems of these services:

1. The problem of establishing the status of the officer in the community
2. The maintenance of his professional status while he is serving on the frontiers of our civilization

And I offer the following solutions:

1. The establishment of community status may be helped by residence not in a country town, but on a property owned and established by the agency concerned.
2. Professional status may be maintained by the development of pastoral ecology as a study of first importance.

Problems of Extension to Industries Located in Mainly Agricultural Areas

Unfortunately Bruce Levy could not help me very much with this group (papers 22, 29, and 30); his description reads as follows:

> A complex farming group where cultivation with its concomitant soil amelioration and moisture absorption and conservation plays an enormous part in the production of rotational pastures and animal crops.

The very complexity of this group precludes any useful generalizations and I proceed straight to the individual contributions.

An extension service to the sheep and wool industry in the Victorian environment (paper 22) means something very different from those to the truly pastoral areas we have considered earlier because of the opportunities which the grazier has for affecting the quantity and quality of the raw material he presents to his converters. However, to exploit these opportunities adequately (technology and environment), a considerable investment of capital may be required and precise advice is needed from the extension service. Hence the need for applied research, at present a function of the extension staff which may well limit the time available for other extension work, even when the situation is appropriate for operation through the innovators. The suggestion for the encouragement of farm management clubs and cooperative extension projects with private services as complementary to the State service is a logical one. However, it may not be so easy to 'preserve the local identity and status of the State service', desirable though this may be. We will see in paper 35 how the Italian farmers on the M.I.A. came to regard the liaison officer as the authority rather than the subject specialists for whom he interpreted; it is my guess there might be a similar reaction among Victorian graziers.

Paper 29 describes an effective piece of operational research in relation to a special problem of harvesting technique. We must admire the frankness of the report, I quote 'it was found that none of the industry groups were fully meeting their obligation toward the good harvesting of barley'. It is good to read of the success of such a broad-based cooperative extension project.

The farming situation described in paper 30 appears even more complex than Bruce Levy could have imagined, but the philosophy underlying the extension programme is most stimulating. Again we see the necessity for local experimentation described as an unfortunate preoccupation limiting effective extension work. One hopes that the author's expectation of T.V. as the extension medium to solve his problems is realized; if so he will have developed a technique in which many of us will be interested.

In summing up this group one may be permitted to ask if the need for precise local information has not been over emphasized. It might be suggested that at the present standard of teaching of plant and animal physiology any adequately trained professional should be able to offer helpful advice in many situations to be clinched by a simple experiment. Let me quote a thoughtful American medico:

> Only the patient who somehow recovers promptly after the first treatment is spared a series of small experiments . . . Off-the-hook treatment has less to commend it than tailor-made experiments . . . No matter how one views it, no patient can avoid being the subject of some kind of investigation. Let each of the latter be well planned and well executed; let them be useful to both patient and medicine. Let each new patient be a complete experience.

Problems of Extension to the Farmyard Industries

Papers 24, 25, 25(a), and 36 are covered in this group. The factors common to the group are the relatively high labour factor in production costs and the attraction to these industries of people with modest capital. One paper deals with a major farm enterprise, the other three with side-lines.

On the evidence presented in paper 24 we are brought face to face with the fact that closer settlement for dairying does not *ipso facto* provide a suitable environment for an extension programme through the innovator and early adopter groups when husbandry routine keeps 'the farm owners and managers who are also the main labourers' on the job at the same time. The case is presented for the use of specialist dairy officers exercising an almost pastoral care of their flock, or should I say herd, and giving extension advice (largely in the matter of priorities for expenditure of the labour resources) in accordance with needs which they assess. The reference to the special requirements of newcomers to the industry is important.

Paper 25 describes a broad approach to the problems of an extension service for the pig industry in Victoria. Although using all appropriate media and to advantage, stress is laid on the importance and value of advisory visits to farm;

staffing and other commitments permitted about 400 of these in 1961, of a possible need for 10,000, i.e. 4%.

Paper 25(a) gives a detailed report of the activities of a poultry extension officer in a district where this enterprise is a side-line, but an important one. A courageous attempt is made to assess the value of the service given by making intelligent use of several statistical yardsticks; of these, that concerning capital expenditure on housing is of particular interest.

Paper 36 is concerned with the pig industry only incidentally. It shares with paper 26 the problems of the introduction of a new industry to the farmers of North Queensland (pig production to maize and tobacco growers) and with 35 the problem of extension services to a migrant population. Regarding extension methods, the author regrets the circumstances which made mass media ineffective and that extension aid for these people had to descend to the difficult and time-consuming level of personal approach. There is every evidence that this was most sincerely given after the suspicious and antagonistic attitude to would-be helpers had been overcome. It is difficult to imagine how the necessary understanding of the men and their farming conditions and the building of confidence in the officer's ability to see them through the programme could have been achieved by any other means than by regular farm visits.

Problems of Extension to the Horticultural Industries

In view of my complete dissociation from horticultural extension I am properly hesitant in attempting to extract principles or methods from the evidence presented in papers 26, 27, 28, and 35.

Paper 26 describes the rather special extension methods, particularly on-the-farm instruction, adopted for the establishment of a new enterprise — pineapple growing, apparently as a side-line — on North Queensland farms, and ends with the report of its vulnerability to economic change, the same point made regarding the Victorian pig industry in paper 25. One would perhaps like to know what became of the special staff assembled for this venture.

In paper 27 we have evidence of the willing cooperation induced and sustained in a specialized banana-growing community by the threat of a serious disease, and the wise use of the organization developed mainly for this purpose (community protection) for other extension methods. It appears to be an outstanding example of producer cooperation with the extension agency, though I understand similar examples could be quoted from sugar-growing districts in Queensland.

It is unfortunate that some such visitation or disaster (paper 28) does not follow smartly on the misuse of irrigation water in the Merbein–Redcliffs area in Victoria, and so induce a community effort on the drainage problem. I understand that metering of irrigation water supplied, handled enthusiastically by the same authority in other areas, presents a technical problem where delivery is from channels with a low head. A solution of this engineering problem would appear to be a major contribution to the extension programme. The attitude of some members of this community that 'if enough pressure is applied in the right places long enough' the drainage scheme will be enlarged by Government action reminds me of a recent Canadian comment (4) that 'most Governments have certain policies in which extension, service, and hand-outs are difficult to separate'. Need I add that in this we hear the lone academic voice of a university professor.

Paper 35 reports the success of the Italian Liaison Officer System in extension work to the vegetable growers on the M.I.A., but sounds a warning regarding the tendency for the L.O. to become a direct contact between the Department and the grower which 'had to be abated in order to maintain the desired objective of the L.O. operating as a link between the extension officers and farmers'. Valuable side effects are also mentioned.

That, Mr. Chairman and gentlemen, completes my review. In returning the session to you for the discussion, may I refer you to the text:

> The words of the wise are as goads, and as nails fastened by the masters of assemblies.
> *Ecclesiastes* **12**: *11*.

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PAPER 21

PROBLEMS OF EXTENSION IN THE BEEF PASTORAL INDUSTRY IN QUEENSLAND

By W. F. Mawson and D. N. Sutherland*

While several Branches of the Queensland Department of Agriculture and Stock are concerned with extension work in the beef industry, the Cattle Husbandry Branch plays the major role. Its responsibilities lie in the fields of advising on methods of the breeding, feeding, and management of beef cattle. The Branch was formed in 1948 and this paper reviews the problems of extension as they appeared at that time. The methods employed in dealing with these problems are outlined, together with a note on the results obtained.

THE PROBLEMS

The problems appeared to be of two broad types — the first concerned the problems of communication in general and within the confines of the beef industry in particular, while the second type were on personnel and technical matters.

TABLE 1†

BEEF INDUSTRY IN QUEENSLAND — DENSITY OF PERSONS AND BEEF CATTLE

Area devoted to beef cattle	237,567,621 acres
No. of holdings in which beef production accounts for over 50% of value of annual production	4,379 = 10% of rural holdings
Average area of holding	54,250 acres
No. of beef cattle (1960)	5,757,000 head
Average concentration of beef cattle on holdings	1 beast to 41 acres
No. of residents on holdings	19,706
Average number of residents per holding	4.5
Density of residents	1 person to 12,055 acres

† Source: Bureau of Census and Statistics, Brisbane.

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* Queensland Department of Agriculture and Stock.

Problems Related to the Industry

Communication in general was a basic extension problem. When considered in relation to the beef industry several distinctive features emerged:

1. The industry was of an extensive nature, leading to conditions of comparative isolation with limited opportunity for group contact (see Table 1). Production occurred over a wide range of soil, climatic, and pastoral conditions.
2. An individualistic and pioneering outlook was common among producers. In many cases, the only experience which the producer had of Government employees was in the regulatory and taxation field. There was no tradition of an extension advisory service and the need for such a service was not recognized by all. Until an atmosphere of confidence could be established there was a natural aversion to divulging useful information about property statistics and management.
3. Husbandry research in beef cattle production was on a small scale in southern Australia and results were not directly applicable to Queensland conditions. Under these circumstances producers were not conscious of its value. A gulf existed between the limited research on one side and commercial production on the other.
4. Particularly in the more distant areas of the State, the market for beef products was uncertain and offered little incentive to producers to undertake the heavy capital expenditure involved in producing a greater output.
5. Physical problems, which were a product of the extensive nature of the beef industry, consisted of transport difficulties of various types such as distance from railhead, lack of all-weather roads, and limitations of air transport. In some areas daylight radio reception was limited, and mails arrived at intervals of one week or more and consequently the less urgent mails tended to be neglected or remain unopened.
6. Finally, many absentee owners frequently either failed to define the powers and responsibilities of the manager or allowed him no more freedom of action than required to turn off a given number of stock annually without incurring any additional expense.

Problems of Staff Recruitment and Training

Turning to the second classification of problems, it was evident that progress could not be rapid in the first few years. Lack of trained staff was an obvious handicap. Suitable personnel from the industry were not available for recruitment and a nucleus of experienced field officers from other Branches was obtained. Subsequent recruits have consisted mainly of diplomates of recognized agricultural colleges who possess a sound basic training, but require specialized technical training and experience before assuming responsibility for district work.

The Branch in-service school has proved a useful method of providing advanced technical training to staff. Four such schools, varying in length from two to four weeks, have been held over the past 12 years. Schools spaced at such intervals ensure that new extension staff have an opportunity for advanced training within a reasonable time of recruitment. Since 1955, Departmental in-service schools on extension methods have provided instruction for 60 officers annually. District seminars at the Branch level are held periodically. These seminars are attended normally by the Branch Director plus some other Head Office staff in addition to all staff of a Senior Adviser's district. The typical seminar extends over two days and takes the form partly of a review and partly of forward planning, with all personnel participating. On the whole it appears that the current in-service training is reasonably adequate.

Field staff are backed by a smaller number of personnel with graduate and post-graduate training to undertake and supervise more exacting field research on Departmental stations.

Problem of Lack of Technical Information

It is axiomatic that an efficient extension worker needs technical information which is adequate and applicable. The lack of availability of information of such a nature constituted a serious problem. Australian research in beef cattle husbandry was in its infancy. The considered volume of publications from U.S.A. provided the main source of reference and text material. The American publications could be adapted to form a provisional basis for personnel training. This was not so in the case of recommendations for commercial beef production — mainly because of environmental and industry cost and organizational differences.

Not until 1954 was the Animal Husbandry Research Unit established; it had a small staff and began to work on one important aspect of beef cattle husbandry, namely drought feeding. Therefore, in order to obtain technical information which could be applied in extension work in beef cattle production in various parts of the State, it was evident that a programme of field trials was required.

Early work, begun in 1952, was concentrated on defining the growth rate of beef cattle grazing native pastures in various parts of the State. The performance of typical commercial stock was recorded. Analysis of results led to a definition of the growth-rate patterns of steers in the particular environment. In the course of these investigations three comparative studies on the performance of British breed and Zebu or Brahman crossbreds were undertaken. Following the growth-rate studies, and actually overlapping them, were trials designed to evaluate various methods of 'topping-off' cattle by intensive methods. In collaboration with the Bureau of Agricultural Economics, studies extending for three seasons (1958–60) were made on the economics of crop-fattening of beef cattle. The performance of cattle fattening on crop or improved pasture has been recorded at several centres in various parts of the State.

Input–output data related to the fattening of steers in feedlots was obtained from typical centres and this information has been doubly useful (a) in checking the American feeding standards in the Queensland environment and (b) in having a satisfactory predictive value which acts as a basis for advice to producers contemplating such a system.

In addition to intensive fattening methods, a great deal of attention has been focussed on methods of preventing winter weight loss and in mitigating the effects of drought on breeding cows and young stock. Drought-feeding studies of stock in yards were proceeding at this time at the Animal Husbandry Research Unit. The use of the grazing animal introduces complex factors into a drought-feeding study. Such factors as the energy-cost of walking around bare paddocks introduce variables not readily simulated under pen conditions. In this context the field trials and research studies have been complementary, with both making a significant contribution to the knowledge which the extension officer requires.

During the course of the field trials and investigations, evidence was accumulated which revealed the need for field studies on such management problems as controlled mating, time of mating, and time of weaning. The full possibilities for increased output by adjustment of these practices were defined more clearly as a result of previous work. The need for herd-productivity studies of factors such as branding percentages and rate of turn-off is now becoming recognized in the industry.

Field trials have their limitations. Work such as evaluation of phosphate supplementation is difficult to conduct adequately on private properties. Basic work only can be done at the laboratory or yard level. Hence the need for cattle research stations, where more rigorous animal control can be exercised than is possible on private properties.

RESULTS

From an extension viewpoint, field trials have had valuable effects. Field staff were young men, regarded rather sceptically by many people in the industry. Field trials were not only a means of defining problems and gathering basic information. In conducting these trials the extension officer was able to gain the confidence of the producer. Officers have been thus able to obtain a close knowledge of the industry from the viewpoint of the producer. This has had a gradual snowballing effect and, within 10 years, extension officers of the Branch have become well known and their advice sought and valued by progressive producers. Once mutual confidence has been established and the extension officer becomes known in an industry the major problem of communication is well on the way to solution. So far as the Cattle Husbandry Branch is concerned the attention and interest of the industry has been captured. Three-day schools on cattle production at three centres, organized in cooperation with grazier organizations and other bodies, have rated a total attendance of approximately 800 producers. Applications for attendance at smaller, living-in schools of four days' duration have exceeded the available accommodation.

The number of requests for further schools continues to increase. The whole range of extension methods are employed, but schools are mentioned because they illustrate that beef producers have become sensitive to the fact that extension services have become a force in the industry. Cattlemen are now prepared to devote time, and to travel long distances to get the benefit of the facts, advice, and discussion available at producer schools.

A list of 33 references dealing with technical aspects is available to interested persons on application to the authors.

PAPER 29

BARLEY HARVEST DAMAGE PROGRAMME IN SOUTH AUSTRALIA

By F. B. PEARSON*

Barley has always been an important crop in South Australia. In recent years it has become a major one with a ten-year-average annual production of nearly 26 million bushels, and a maximum yield of over 42 million bushels in 1960/61. The gross value of barley produced in the 10-year period exceeds £145 million. The best-quality barley is used by maltsters, and this brings the highest returns to growers. Good barley can be spoiled by damage done to the grains during harvesting. When this damage exceeds 5–6% the barley loses value. It is estimated that 4–6 million bushels of barley are damaged during harvesting each year. This results in a direct loss to growers of from £250,000 to £500,000 a year.

The rapid increase in barley-growing in South Australia in recent years brought many new growers into the industry. These new growers do not always appreciate the need for careful harvesting.

The Australian Barley Board is responsible for receiving, storing, and marketing the barley grown in South Australia and Victoria. As the marketing authority, the Board realized that harvest damage was becoming a major cause for complaint among barley buyers, and in October 1958 the Chairman called a meeting of interested parties to discuss harvest damage and the losses arising out of this. The different industry groups concerned with barley were asked to attend the Conference and among those represented were:

1. The Australian Barley Board — including representatives of merchants and farmers from South Australia and Victoria, and the Victorian Department of Agriculture
2. Barley-growers from several important South Australian districts
3. The South Australian Department of Agriculture
4. Makers, importers, and distributors and harvesting machinery in the two States
5. The agricultural press of South Australia

The Conference formed a committee from the various groups

1. to organize an intensive campaign against harvest-damaged barley
2. to educate growers and others in methods of reducing grain damage as much as possible

This committee, working under the Department of Agriculture representative as Chairman, carried out a series of field investigations into the problems associated with barley harvesting during the 1958/59 harvesting season. Field work was done in five different districts, with eight models of the four principal makes of harvesting machinery most commonly used, in temperatures varying from 66°F to 96°F.

During these investigations it was found that none of the industry groups were fully meeting their obligations toward the good harvesting of barley. The Department of Agriculture had not educated farmers in the need for careful harvesting nor acquainted them with the losses arising out of its neglect. The Barley Board did not sufficiently educate its licensed receivers and agents in what is good barley and did not make sure that growers were being properly and quickly advised of damage to grain during harvesting. Machinery manufacturers, and more particularly their country agents, had little real knowledge of good barley harvesting, nor of the adjustments required to achieve this. Many growers lacked knowledge of barley classification, and of what is properly harvested barley. Many also were indifferent to, or lacked knowledge of, the full capabilities of their harvesting machines and the adjustments required to enable these to reap efficiently.

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* South Australian Department of Agriculture.

There are several things which make the South Australian barley-grower want to speed up his harvesting. These, because speed is one of the main causes of barley damage, became specialized problems which had to be considered.

Some 75–80% of the barley grown in South Australia is of the one variety, Prior. Prior is a good barley, suitable for malting purposes, adaptable to most South Australian districts, and grown widely in all of them, but with one serious fault. The weak straw, when ripe, is very susceptible to breaking off in a strong wind. A 'barley wind' can break off heads to the tune of 1–2–5–10 bags or more to the acre. Growers therefore hurry to get their crops off before the wind does this, even though they know that reaping too quickly or with a machine not properly adjusted will damage the grain. They claim that the loss from wind could be greater than that from down-grading — and this is often true. Because one variety is so largely grown, the crops tend to be ready for harvesting around the same time.

Much of the barley is grown on ley land worked up after the opening rains and not finally prepared for sowing until after the wheat crop is in. This makes for late sowing, and the tendency is further encouraged by the possibility of Prior 'haying off' if sown too early in fertile soils. The result is that seeding is done in a few short weeks. This concentrated seeding further accentuates the ripening of many of the crops at the one time, adding more haste to the job of getting the barley reaped as soon as it is ready, and before heads are broken off. Nearly all of our barley-growers are also wheat-growers. By the time barley harvesting is under way, the wheat is getting ripe and ready to reap. This is another spur. The South Australian barley-grower feels the cumulative effect of these several things all urging him to get his barley in the bag as quickly as he can. They could all affect his total financial returns one way or another. So he wants to get on with barley reaping quickly, even if some grain is damaged and loses value. At least he's got the bulk of it in the bag, and that's something.

The committee had to allow for all these things if they were going to get any reduction in barley harvest damage. In a programme spread over two years, involving considerable numbers of people in the different associated industry groups, this was done satisfactorily and with good results. The Barley Board developed procedures for quicker notification of growers regarding damaged barley so that, if reaping was not completed when the first samples came in, adjustments could be made. The Board also held schools to increase its officers' and receivers' knowledge of barley damage recognition and correction. Machinery manufacturers held schools to educate their representatives, particularly in the country, in knowledge of barley damage recognition and the machinery adjustments necessary to correct it. Department of Agriculture officers and maltsters were also educated in various aspects of the problem, and the press and broadcasting stations gave valuable publicity to the campaign.

After all the other industry groups had been educated and prepared, a series of barley harvest damage conferences was arranged to let the barley-grower understand the problem better and to help him reduce the losses arising out of it. During the two years 1959–1960, thirty-four conferences were held in different barley-growing centres in South Australia and the cooperation and effort of each of the different participating groups was well maintained. Over 2,200 farmers, some 18% of South Australia's 12,500 barley-growers, attended one or other of these conferences. For each conference all barley-growers in the immediate district concerned were sent a personal invitation asking them to attend. This was backed by newspaper advertisements and write-ups, radio announcements, posters, etc.

Each conference was divided into two parts. The first part took place in the local hall and was chaired by an officer of the Australian Barley Board, who explained the effect of harvest damage on the value and marketing of barley. Then a maltster representative illustrated and explained the effect of damage on the barley grain. This was followed by Department of Agriculture officers, who discussed the general machinery faults responsible for damage and described the various types of grain damage which occurred. Then, while still in the hall, all growers were encouraged to handle and examine sound grain and compare it with grain damaged to different degrees. The first part took about 1½ hours and then growers were moved to various nearby locations where current models of the four most popular types of harvesting machinery had been previously assembled and prepared by representatives of the various firms. Maker experts then described their respective machines and the settings and adjustments necessary, together with the faults likely to occur. These were illustrated by practical instruction.

The complete cooperation of all participating groups, which included supplying and maintaining their own personnel and requirements, and the ability of the machinery firms to regularly supply current models of the different makes of machine at suitable locations were responsible for the success of the campaign.

Apart from the improvement in harvesting, the campaign resulted in a greater awareness of barley grain quality and of the necessity to maintain as high a standard as possible among growers, machinery representatives, Department of Agriculture officers, and others. It increased the outflow of essential information from the Barley Board to the grower, and improved the relationship between the two parties. It encouraged machinery dealers to keep better spare parts supplies, and increased their knowledge of adjustments for reaping barley so that they could give growers a better service. It also helped growers realize that there were a number of things they could do, and a number of places where they could get some help, to overcome their problems.

The better understanding of each other's problems and viewpoints, and the closer liaison developed between all interested groups cannot but continue to be valuable to the industry in the future.

PAPER 31

RABBIT CONTROL
A NEW APPROACH NEEDED TO AN OLD PROBLEM

By B. V. FENNESSY*

For many years all the States of Australia have had legislation which imposes on individual landholders the responsibility to do rabbit control work. To implement their Vermin Acts, all States had, by 1950, some form of departmental or local organization. In most cases, inspecting staff — known as rabbit inspectors — were employed to see that landholders complied with the provisions of the Act, and to initiate legal proceedings against those who did not. Thus the prime function of the various State organizations was regulatory.

INEFFECTIVENESS OF THE INSPECTORIAL SYSTEM

This system had many faults. A really basic one was that, legally, the landholder had fulfilled the requirements of the Act if he could show that he had done some work and that this was all that 'a reasonable man could reasonably be required or expected to do on the particular land', even although rabbits were still there. For this reason prosecutions were often unsuccessful in Court and consequently some authorities were reluctant to attempt them; moreover even if a landholder was fined this often did not cause him to do more rabbit control work.

The relationship between the landholder and the rabbit inspector was mostly bad; the landholder generally resented the entry of the inspector on to his property, and resented being told to 'do something about the rabbits, or else'. Rarely did the inspector give advice about how the landholder might deal with his problem, and when advice was given it was often unsound and took little cognizance of the landholder's problem of integrating rabbit control into his general management programme. Usually the only training a rabbit inspector had been given was in the method of making inspections and of conducting prosecutions.

The prevailing attitude to rabbit control was due largely to the fact that very few people — landholders or officials — had any clear idea of (a) the tremendous amount of damage rabbits could cause, (b) how to cope effectively with the rabbit population, and (c) what the objective in control work ought to be. Thus it was generally accepted that rabbit populations would show considerable fluctuations and would sometimes reach 'plague' proportions; that the general objective in control work was to attempt to 'keep rabbits down'; that as all the landholders in an area could not be expected to work simultaneously on rabbit control and as district-wide eradication was considered to be impossible, an individual property would always be subject to the risk of reinvasion. Hence there was not much point in the individual landholder striving for eradication; the best he could do was to cut the population back occasionally, and this was usually done by an annual 'blitz'.

Implicit in the inspectorial system was a general recognition of the individual landholder's difficulty in achieving rabbit control, and of the need for a fair and reasonable interpretation of the legislation. Obviously a system with such limitations would be unlikely to produce long-term effective control of rabbit populations.

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This was the situation generally up until 1950. There were a few properties which were rabbit-free, but generally the inspectorial system had been inadequate to prevent or to cope with the large-scale build-up of the rabbit population which, because of seasonal conditions, occurred in 1949/50, so at that time many properties were in the grip of a rabbit 'plague'.

Development of New Techniques of Control

The successful establishment of myxomatosis in the field early in 1951 caused a remarkable reduction in the rabbit population and brought great relief to landholders. Some dramatic increases in production — in carrying capacity, in wool cut per head, and in crop yields — were recorded, and many landholders were given a striking demonstration of what losses they had suffered. Unfortunately myxomatosis was not the complete answer to the rabbit problem, but very few landholders capitalized on the advantages gained by the early high-grade kills by the disease; they were satisfied to tolerate the surviving rabbit population because it was so much smaller than the population of the bad years, and they were encouraged in this attitude when myxomatosis flared up occasionally in succeeding years. They were content with the old idea of an occasional cutting back of the population after it had built up, and there was no recognition of the advantage of a continuously maintained low or nil level of population. Their attitude was akin to that of the landholder who establishes a new pasture, but does not manage it to get the maximum possible production. Meanwhile, at the official level there had been little change in outlook from the inspectorial approach.

In 1952/53 the poison sodium fluoroacetate — '1080' — was introduced, and a technique of using this, based on studies of the behaviour of rabbits, was worked out — a technique which if followed carefully produced very high levels of kill, but which was difficult to explain to landholders except by practical demonstration on their own properties. The system by which the poison was made available to landholders was, for safety reasons, such that in some of the States landholders had to request rabbit inspectors to supply the poison and to mix it with the bait material. Landholders who in the past had as a group avoided meeting the rabbit inspectors, now had to consult with them. The inspectors, after some training in the use of the poison, were able to give the landholders practical advice about its use and in some cases actually did part of the poisoning job. This has provided the begining of extension-advisory services in rabbit control, which are still very much in their infancy.

Objectives in Rabbit Control

Whether these extension services in rabbit control grow is going to be determined largely by the attitude of landholders and Departments and the extent to which they set themselves clear objectives. They may remain content with the *status quo*; they may seek for a much higher level of control so that the rabbit population is continuously maintained at a low level; or they may set themselves an objective of complete eradication. Complete eradication, i.e. a final infestation of nil rabbits, is the only objective which is clear-cut and towards which one's progress can be definitely measured.

Complete eradication has been achieved on individual properties in the past; there are no technical reasons why it cannot be achieved on many more properties in the future, and the possibility of doing so is considerably greater when the rabbit population is so much lower than during 'plague' years. If more and more adjacent properties could be made rabbit-free this would reduce very considerably the long-term costs of keeping rabbits out of individual properties. Thus group eradication schemes with active landholder participation seem to be the logical solution in a lot of the relatively closely settled areas — short of local authorities taking over completely from landholders the responsibility for rabbit control as has been done in New Zealand.

A recent test of this group approach in the Bathurst, N.S.W., district on 43 properties covering 9,000 acres has indicated that this system may be practical even within the limits of the existing legislative powers. In this project the landholders set a clear and definite target of nil rabbit infestation. They did the work themselves working together in groups on one another's properties; this had the advantage of helping to relieve the tedium of the work and also meant that higher standards were achieved. Social pressure, arising from the fact that there was intense community interest and effort, was sufficient to bring most landholders into the scheme, but if individuals refused to cooperate the local rabbit control authority had power under existing legislation to do the necessary work and the cost of this became a charge on the land. The local authority also assisted by providing the initial stimulus, by organizing local meetings, and by general advice and practical help in the project. Complete eradication has not yet been achieved, but is well within sight. The immediate result has been that six similar groups have been formed in adjacent areas, and about eight local authorities in other parts of the State are thinking of starting the same type of scheme.

EDUCATING STAFF AND LANDHOLDERS FOR NEW OBJECTIVES

A major problem in all States is that of ensuring that well trained rabbit control officers are available, and the successful implementation of district schemes for real eradication will be dependent on this. New appointees should be selected on the basis of their ability to act primarily as extension officers and should receive special training for this, but many of the States still have on their staff men of the 'old school' of rabbit inspectors, and some of these are as complacent as landholders about the rabbit situation. However, recent experience has been that many respond well to intensive training, not only in the techniques of control, but in general aspects of rabbit biology and behaviour, given at week-long schools, particularly if they are shown that by being advisers and helpers to landholders rather than inspectors they can achieve satisfying results in the form of much lower rabbit populations in their districts and much more pleasant personal relationships with landholders. The extent to which they can do this is determined by the backing they receive from their Department or local authority.

If we accept that very much higher standards in rabbit control are necessary and that they are economically worthwhile, there is a real need to educate landholders about these objectives and to encourage them to seek the advice and help of their district rabbit control officers.

PAPER 32

EXTENSION AND THE RESEARCH WORKER IN THE NORTHERN PART OF THE WESTERN DIVISION OF NEW SOUTH WALES

By R. D. B. WHALLEY*

Merino wool production is the most important agricultural industry in the western division of New South Wales, but some beef cattle are run. Property sizes vary, averaging about 15,000 to 20,000 acres in the east, and up to 100,000 to 200,000 acres in the remote north-western corner. A little irrigation of very recent origin is developing along the Darling river.

Land tenure is largely under the control of the Western Lands Commission of New South Wales, which also exercises a measure of control over stocking rates, etc. through Western Lands Inspectors stationed in the major towns.

Climate and Effect on Living and Working Conditions

The climate of the region has been described in general terms by Beadle (3), and James (7) has described the north-western quarter in greater detail.

The hot, dry climate has quite profound effects on human comfort and activity. The most important element in this respect is heat, while dust, glare, and insect pests also contribute to discomfort. The human physiological adaptations to heat which occur in such a climate have been described by McFarlane (9). The extent to which they are developed varies with the individual and with his occupation.

Macpherson (10) describes a high incidence of problems of human adjustment in the Australian arid zone, brought about by the above factors together with the isolation and the general barrenness of the land. These circumstances are particularly hard on women bringing up young children.

Although conditions in the north of the western division of New South Wales are not as extreme as in northern and central Australia — the areas referred to by the above workers — the same reactions to the climate apply, only to a lesser extent.

The effects of climate can be ameliorated to a marked degree by direct attack on the elements concerned. Modern communications and transport have done much to lessen the effects of isolation, and participation in Progress Associations, sporting and social clubs, etc. by the station people has increased markedly in recent years. Modern housing design using the principles discussed by Lee (8) and the widespread use of evaporative cooling devices can do much to alleviate the effects of the climate. Any effective agricultural extension service in the region must be concerned about these methods, for the benefit of both the graziers and its own officers, who also have to live and work in the area.

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Existing Extension Services

The formal agricultural extension services in the area under discussion are extremely limited in relation to its size. Two to three officers of the Soil Conservation Service cover the whole of it, while the Forestry Commission maintains District Foresters at several centres such as Cobar and Broken Hill. Officers of the Water Conservation and Irrigation Commission are available in the larger towns for advice on farm water supply problems. Veterinary Inspectors are attached to some of the Pastures Protection Boards.

The only Department of Agriculture extension officers in the area are District Livestock Officers (Sheep and Wool) stationed at Brewarrina and Broken Hill and these officers have only been available since 1960. Officers of the Western Lands Commission are also stationed in some of the larger towns and, as well as their regulatory functions, do a certain amount of advisory work.

By far the major part of advice to graziers relating to station management comes from the stock and station agents and other private individuals. Although it is not suggested that this advice is not given with a genuine desire to help, the people concerned have had little, if any, formal training and cannot hope to be as effective as properly trained, disinterested extension officers.

Limitations of the Present Services

The difficulties in providing extension services in this region are similar to those described by Nunn (12) for the north-west and Kimberley regions of Western Australia. The population is scattered; much time is spent in travelling from place to place and it is often difficult to get people together.

Extension officers in New South Wales are usually drawn from the higher-rainfall areas and are trained in agricultural colleges and universities also located in the more humid portions of the State. Therefore, it is to be expected that an extension officer posted to this area would take several years to become accustomed to the conditions and the problems encountered and to be accepted by the graziers. Extension information is based on local knowledge and experience as much as actual research results (4). A further difficulty is to find officers who are prepared to accept such postings and to remain for a sufficient period of time to become effective extension workers. If such officers are to remain for only a limited period, say two years, they can achieve no useful purpose and the positions would be better left vacant until more permanent appointments could be made.

The most important factor limiting the effectiveness of the present services is the general lack of knowledge about the problems of the area. Improved practices relating to animal health and disease control can often be extrapolated from higher-rainfall areas, but, particularly in the fields of stock management, pasture management, and pasture improvement, the problems are largely undefined. Extension officers with little or no training in research are at a serious disadvantage when dealing with problems of this kind.

Research and Extension Work

The agronomic research work carried out from Trangie is mainly concerned with definition of the problems and involves a considerable amount of travelling throughout the area. In this way, contact is made with quite a large number of graziers and, during discussions, many questions of an extension nature are dealt with. These questions are not confined to agronomic work, but often cover all fields from home gardening to sheep husbandry and often require reference to an appropriate specialist. In addition, enquiries of an agronomic nature from graziers in the area to head office are directed to the research agronomist at Trangie in accordance with usual Departmental procedure. The result is that the research agronomist finds himself spending a significant portion of his time dealing with extension matters, either by correspondence or in discussions when travelling in the area.

This combination of both research and extension functions in the one officer in such a region is far from undesirable. The report of the Forster Committee (6) on the prospects of agriculture in the Northern Territory emphasized the importance of the parallel development of basic research, applied research, and extension if an adequate service to the rural community was to be provided. It is but one step further to combine the functions of applied research and extension work in the one officer.

Alternative Approach to Extension

The graziers in the western division of New South Wales have as much right to adequate extension services as graziers in any other part of the State. However, the majority of funds for research and extension are, quite rightly, concentrated in the more humid regions where the returns on a national scale are higher. It remains to devise the most efficient way of utilizing the limited resources which are available for the western division.

It is suggested that the appointment of extension officers with no previous experience in the area, with no applied research results on which to base recommendations, and with the prospect of remaining in the area for only a limited period, is not the most efficient way.

At the present time, there appears to be little prospect of providing adequate research and extension services in the western division on a regional basis. For the present, the appointment of small numbers of research officers at a centre such as Trangie, charged with defining and investigating problems of an applied nature in the area, might lead to a better service to the graziers. These officers would be on the fringe of the area and would be in contact with workers in the same and related fields and would enjoy better living conditions. These appointments would be of a permanent nature to enable the officers to become thoroughly acquainted with the conditions and should carry sufficient salary and opportunity for advancement to attract and retain high-calibre staff.

The aim of these research workers would be to select a small number of progressive graziers and enlist their cooperation in carrying out trials of an applied nature. Cooperation by graziers in the present series of pasture trials has been outstanding, and more graziers than can possibly be handled by one agronomist have asked for trials to be carried out on their properties. The application of improved practices can be demonstrated through these trials. It is a well known characteristic of rural communities that such 'result demonstrations' are the most effective way of disseminating information through the community (5; 13).

As knowledge increases about western division problems, the demand for extension services will increase and appointments of the conventional type will become necessary. Officers who are not affected by the amount of travelling and the rigorous climate will find an interesting and very satisfying existence in a relatively new area for research and extension work.

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PAPER 33

EXTENSION SERVICES IN THE ARID-SCRUB ZONE OF WESTERN AUSTRALIA

By D. G. WILCOX*

The average property size in the mulga zone in Western Australia is 500,000 acres, and even though there are only 200 pastoralists here, they are scattered over an area more than 500 miles across, occupying about 160,000 square miles.

The immediate challenge to the newly appointed adviser is the immensity of his area, with all the associated features of vegetation, soil, climate, and even population changing in major ways from one part of the zone to another. Since a visit to a station takes at least two days to complete, it is unlikely that each station would be visited more often than once every two years.

It is a zone where very little research on any aspect of agriculture has been carried out. When I arrived there was no background information on the growth habits of the pasture plants, the reactions of the pasture to the grazing animals, the relative value of the pasture plants, or the behaviour of the animals in the environment. There was, in fact, no information available upon which sound advice could be given. Since the region had been neglected for so long, and since net returns were so high, the residents of the area were unaware that changes in management practices could increase their income and prolong their utilization of their leases.

The problem for the new adviser was then twofold. There was no advice which could be given, and the community in general was ignorant of the role of an adviser and the benefits that could be derived by the adoption of new practices. It was always agreed that research into problems in the farming areas had improved production, but it was considered that these fundamental principles did not apply to the type of agriculture practised in the area. In fact there was no attempt to come to terms with the environment, but only to take advantage of its occasional extravagances.

To make effective extension possible it was necessary to undertake some research into what seemed to be the most pressing and immediate problems of the region. To begin, the vegetation had to be classified into its various types, based upon geology, location, soils, and vegetation, and within each pasture type the various problems had to be defined. This was a completely new line of research and it was always absorbing and rewarding. And as solutions to these problems became available, the adviser was able to approach the pastoralists, confident that the adoption of his suggestion would result in greater productivity and greater security for them.

As most of the pastoralists within the region have been personally responsible for the establishment of their properties, they are, understandably, individuals dependent upon their own judgment for their economic survival. To suggest to most of these men that they should change their practices is to suggest to them that their management is unsound. Some consider that the adoption of new practices is a submission to an ill defined authority personified by the unfortunate adviser. Some, of course, as in other areas, are not prepared to expend any effort towards improving their situation.

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* Western Australian Department of Agriculture.

The adviser then has to establish himself as a competent authority. In most cases the first visit to a station is in response to a call for specialist advice on gardens, on water supplies, on plant diseases, on insect pests of plants and animals, on toxic plants, on the death or unthriftiness of livestock, but never on the management of sheep and pastures. If, at this time, the adviser is able to give sound advice on these specific problems, the pastoralist is often prepared to entertain some discussion on the management of his sheep and his pastures.

It is necessary for the adviser to be able to deal with as many facets of agriculture at this level as possible. His training, if he is to be successful in this environment, should be broadly based, and not confined to one particular aspect, such as plant ecology. This is not to suggest that other workers in the area will always need this basic education in every field. It has proved invaluable in my own case, since specialist services are often 600 miles or more away.

In an effort to contact more pastoralists, field days are held on properties where experimental trials are in progress. These are usually well attended and some invitations to call do follow upon these. The demand for advice will undoubtedly increase as the benefits resulting from the new practices become visible over the boundary fence. Extension in this area is always very personal, for it must involve the adviser living on the station for some days, looking at all the paddocks with the pastoralist, and giving his advice on each of them. The adviser must wait for an invitation to do this. He cannot just arrive, expect to be accommodated at the homestead, and expect the station manager to spend several days with him.

Apart from these problems which the adviser must counter in his official capacity, there are difficulties of a personal nature peculiar to the environment.

The climate is mostly unpleasant. For seven months of the year it is very hot, and for three it is extremely cold. The housing that is provided is usually designed for more temperate regions, and not for the rigorous climate of the arid-scrub zone. Dust storms and droughts are a normal feature of the area. But these bodily discomforts are quite secondary to the difficulties associated with the narrow and confined social climate in which the adviser has to live. The change from the sheltered life within a university to the raw existence of the pastoral region is great and is one which involves considerable adjustment in the concept of what is acceptable conduct. The adviser has to live in a small town, built in this case upon gold-mining activity, which has long ceased to prosper and has left its mark only in abandoned leases and derelict buildings. He has few contacts with the townspeople, but must try to make these, or live the life of a recluse.

Where other Government officials can leave after serving a short period in the area, the adviser only begins to feel confident in the environment after two years. Since his relations with pastoralists are always intensely personal, it is essential that the adviser live in the area long enough to know each pastoralist and to understand his individual problems. The need to stay so long in the area is often a deterrent to the married adviser with children. Not only does schooling become a problem in small towns, but the necessary dental and medical care become difficult and expensive, since there are no dentists and only one medical officer in the area.

Providing an extension service in the arid-scrub zone is continuously interesting and challenging, even if it is only overcoming the outdated prejudices held by some. Extension officers tend to become unsettled because of the climate, the distances they have to travel, the loneliness and isolation, and the extremely high cost of living in the area. Within the framework of the Civil Service they are treated as if they lived in large towns with good amenities. Small district allowances are paid, but they do not cover the loss of theatres, libraries, and social contacts and similar intangibles.

On the other hand, the extension officer should attempt to live within his new community. In small towns, men such as he are capable of giving leadership and drive to the various civic bodies, in itself a rewarding occupation. He can also join the different sporting and racing clubs and there meet his 'clients' in an atmosphere removed from his normal contact with them. These activities can make his life in the area more pleasant and his extension activities more effective.

SECTION IIIB

Case Studies of the Work and Problems of District Advisers

LIST OF PAPERS

PAPER NO.

37. Work of a District Farm Adviser. *By* G. B. Rayner.
38. Work and Methods of a District Farm Adviser in the Cereal and Sheep Areas of Western Australia. *By* T. E. McDowell.
39. Work and Methods of a District Farm Adviser. *By* W. M. Johns.
40. The Work and Methods of a District Agricultural Adviser. *By* G. K. Robinson.
41. *Withdrawn.*
42. Improving the Efficiency of Sheep and Wool Extension Work on a District Basis. *By* R. B. Young.
43. The Extension Officer's Approach to the Individual — A Case Study. *By* C. P. Joyner.
44. The Coleambally Project — A Case Study. *By* D. E. Wallin.
45. *Withdrawn.*
46. The Work and Methods of a District Farm Adviser — Case Study. *By* E. C. Darley.

REVIEW

By W. B. MILLER*

More than half of the 156 papers submitted to this Australian Agricultural Extension Conference mentioned the District Agricultural Officer (however he may be officially designated), and he is usually described as the key man in the movement of communicating knowledge to farmers so that they may be better equipped to increase the efficiency of their agricultural production. These men include the 'general practitioners' of the service who, in addition to filling that role, are usually specialists in some particular aspect of scientific agricultural production, e.g. pasture improvement, wheat culture, irrigation, etc.

At this Conference it appears that about 30% of the delegates are practising Government-employed district officers, some 5% are privately or self-employed advisers, and perhaps 30% are specialists who have in their past experience worked in the country. The balance of the Conference delegates represent a wide range of persons interested in the success of agricultural extension. I propose we agree that the district adviser is in reality the key man in the operation.

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* Deputy Director, Victorian Department of Agriculture.

You have already heard in the previous session of the special problems being experienced by advisers in various physical and social environments, and have considered ways and means for their solution.

As we are here mainly in an endeavour to discuss possible improvements in the effectiveness of agricultural extension, it is natural that there are many papers highlighting problems and few setting out less dramatically the day-to-day and year-to-year steady service given by the officers stationed in districts to serve their farming communities. In fact your Organizing Committee arranged it this way, well knowing that the district agricultural officer service would be featured in the early papers (Nos. 1–6), those contributed by the State Government Departments of Agriculture. These valuable statements have, possibly for the first time under one cover, displayed the structures of the Australian Government agricultural extension services, with statistics descriptive of the personnel employed. Each service has its particular structure, with or without a separate Division of Extension, but all have considerable numbers of both full- and part-time district extension officers. The definition of such officers may vary a little, but it appears that on the mainland there is an equivalent of approximately 1,200 full-time Government agricultural extension officers which includes staff stationed in the country and in the cities. The number is far from sufficient to meet the needs, but is quite considerable in relation to the 252,000 rural holdings in Australia.

I am sure that the Conference and the farming community recognize the importance of the district officer, not only his service to the farming community, but also his value as a country agent for the Government Departments which he represents and to which he reports on the state of agriculture in his district, its progress and its requirements, its potential and its problems. When campaigns are conducted, as they were in a major way during the last war, or more recently, e.g. concerning fodder conservation, then the district officer is invaluable to organize on a district basis and to evaluate results. His function in communicating in priority the needs of a district and its various forms of production for further extension or research services is also most important.

The Conference papers by district officers from each State in this Section provide the opportunity for discussion of their work and comment regarding their role, both now and in the future. It is an opportunity also for delegates engaged in the supporting disciplines, including the rural sociologists, to comment. How do they regard the district officer, how can they assist him, and so on?

Reverting to papers 37–46, we find that they necessarily portray a similar outlook in many respects, but in others are as different as is agriculture itself in its various environments. I have registered for discussion some of the highlights.

Each paper mentions and describes briefly how the officer carries out his work through the usual channels, summarized by Mr. Rayner of Victoria as:

1. impersonal — through press, radio, T.V., and intermediaries
2. inter-personal
   (a) with groups through lectures, discussions, etc.
   (b) with individuals through farm visits, interviews, correspondence, etc.

He works in a mixed farming district and considers that once an officer knows his area thoroughly about 80% of the enquiries can be answered from the office, thus leaving time for those visits where personal investigations are needed before adequate answers can be given, or to establish new contacts, interest, and confidence. His is the case of a long established officer, but he admits that there are still many farmers not known or sought by him. What should he do about them, this group who are indifferent to his existence? They are not necessarily poor farmers. Mr. Rayner considers regular radio programmes more effective than regular newspaper articles, both of which he provides, and spasmodic efforts in either direction attract little attention. He heads a team of eight officers stationed in a country city, supervises the work of a group based in another city, and of one young officer working alone in a town some 50 miles away. A real problem and one which the Conference may well discuss is whether district officers, as they increase in numbers, should be grouped in main centres with specialist and perhaps regulatory officers, or whether it is better to spread them to give at least some Departmental service at more centres, and reduce travelling time, but by so doing lose the benefits of regular collaboration between colleagues. Some officers prefer to be in charge of a district rather than to assist in a larger district, but others think otherwise for many, mainly social, reasons. Local opinion would probably favor the wider distribution policy. Incidentally, in Victoria there is no separate Division of Extension, but all Divisions are backed by a Central Information Branch.

Mr. McDowell, working as a district farm adviser in the cereal and sheep area of Western Australia, refers to the slow early progress made in pasture improvement 'because of lack of advisers stationed in country areas' until after 1950, and emphasizes the value of pasture improvement groups, 7 in his district and 60 in the cereal and sheep areas. They have assisted materially in bringing the adviser closer to the farmer. The problem of so doing adequately is very real, as the creation of goodwill, leading to the establishment of confidence in the advisory service, is the major objective after the arrival of a new officer in the district. Mr. McDowell also touches on the subject of the result demonstration or experimental work being conducted by the extension officer. He suggests that this can be overdone at the expense of reduced contact with farmers' problems. What is the correct balance? It must vary with the individual circumstances, but should extension officers do any experimental work at all? It is the usual objective to provide assistance, but if this is not supplied, then what? Something must suffer. The answer seems to depend on the real need for more data in relation to that already possessed by the adviser, and the importance of the extension programme.

Mr. Johns, operating in an intensively farmed district in Tasmania, describes the field supervisory work carried out by his Department for the Agricultural Bank and Closer Settlement Board, in his case on 79 properties. This responsibility demands close study of farm management, and some such form of pressure on officers is probably advantageous. There is no doubt that efficient district advisers will be required in the future to give more time to the profitability of production methods. Mr. Johns says that requests for farm visits obviate free lancing, and others raise the question of whether it is ideal to leave matters that way—servicing in priority the leaders, innovators, and others who wish to work with and welcome the Government officer.

Should not some method be devised whereby the adviser will be in touch, as soon as possible, with practically all the farmers, whether they be good or only fair managers. We may say there is no time, or even that it is not dignified or advisable to push such contacts. Surely it should be an objective. There are subtle ways of achieving it through groups, young farmers' clubs, or by surveys, and the small farmer in particular needs help.

Mr. Robinson in South Australia referred to the necessity for farmers to be knowledgeable about machinery. In this mechanical age, a large proportion of farm costs go into machines, and their efficient use can be vital. The move being made in some States to provide regional machinery specialists to support the general practitioners will be the envy of those without such assistance. Farm machinery courses for advisers are valuable, but not sufficient, in my opinion.

Mr. Wallin of Griffith, N.S.W., modestly indicates how technical assistance is invaluable to the successful settlement of a new irrigation area, refers to the necessity for group extension work, and forecasts a heavy future demand from farmers for assistance. One gets the impression, when reading the papers of this and other related sessions of the Conference, that the district officers as a whole are in real need of assistance to carry out their tasks in the manner they well know to be desirable, but for which the means are not available. Both men and equipment would reward their enthusiasm.

Mr. Darley of Parramatta, N.S.W., mentioned farmers' classes, which were more popular than film or lecture evenings. Such classes or schools are held in most States, and, although serving a limited number, are valuable directly to those attending, and also in developing leaders. They can be used also as a forum at which the extension needs of the farming community can be discussed and evaluated.

This brings me to my final comment after reading the papers; it was touched on by Mr. Young of Queensland, who wrote 'it is good policy to place part of the onus of organizing extension on producers'. There is no doubt that the views of farmers on what they need most from the extension service should be obtained and respected. Many of the industry organizations make representations concerning their needs (although seldom listed by priorities) and individual farmers and groups approach both local advisers and central administrations.

Would it be an advantage to have local farmers' advisory committees on agricultural extension needs, and, if so, who would select and appoint them? The adviser himself or a local body or bodies? Would the really valuable men come forward to serve on such committees? Have they been successful where tried? Should there be formal, or informal, consultation with farmers to determine their requirements and obtain their assistance?

I trust I have thrown into the ring some points for discussion which, with others raised in the various papers, may help the front line of the Government-employed district agricultural service.

PAPER 38

WORK AND METHODS OF A DISTRICT FARM ADVISER IN THE CEREAL AND SHEEP AREAS OF WESTERN AUSTRALIA

By T. E. McDowell*

Of the Divisions of the Western Australian Department of Agriculture, half have a broad industry basis: dairying, pastoral, and so on. In the agricultural areas with a rainfall generally less than 30 inches, cereal-growing integrated with stock husbandry, mainly sheep for wool, is the main industry. General extension work in these areas is the responsibility of the Wheat and Sheep Division of the Department. No special Division controls extension as a whole in Western Australia. This is in contrast to the organization of extension services in some other States of the Commonwealth. With the growth of district offices at strategic country towns, the general advisers, drawn from the Division appropriate to the main agricultural industry of the area, have been joined by officers of other Divisions: Soil Conservation, Animal Division, and so on.

This, then, is a case study of a wheat and sheep adviser in a typical district here, responsible for extension on crops and pastures, fertilizer usage, and fodder conservation, and for channelling services from specialists outside the district.

Before outlining how the various extension methods have been used, I wish to describe the Narrogin district and the progress made by its farmers over the past fifteen years. Narrogin is situated in the Central Great Southern zone and is the principal town in the zone. It is about 120 miles south-east of Perth and has a population of 5,000. The Narrogin advisory district consists of twelve Shires, extending over an area of about 10,600 square miles. Rainfall varies from 12″–13″ in the eastern extremities to 26″–30″ in the western parts. The district is about 200 miles from east to west and its north–south extent varies from 40 to 90 miles.

Because of rainfall variation, the emphasis in farming changes from east to west. In the drier east the main emphasis is on cereal-growing, especially wheat, with sheep being of lesser importance. With increasing rainfall to the west the emphasis changes to pastures and stock-raising, mainly sheep, but with increasing beef cattle numbers. The importance of cereals is lessened and a bigger proportion of oats is grown. Cereal-growing, particularly wheat, was the major source of income for this region until the end of World War II. Some sheep were carried on most properties and a few farmers had gone in for pasture improvement.

Since 1946 this district, like other districts in the cereal and sheep areas of the State, has undergone a pasture revolution. At this time the real benefits of pasture improvement were beginning to be felt. Superphosphate and subterranean clover seed became more plentiful and farmers were strongly urged to carry out a pasture improvement programme. Many farmers resisted the change because they dreaded clover disease. The major function of the advisory services from this time was to encourage farmers to establish improved pastures. Slow progress was made, however, until the early 1950s, because of lack of advisers stationed in country areas. From 1950 to 1955 several new advisers were appointed to country centres in the wheat and sheep areas. It was then possible for the advisory services to demonstrate the real value of pasture improvement. The adviser : farmer ratio had been greatly reduced, but was still about 1 : 2,000. These officers were generally the only members of the Department of Agriculture in the district.

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* Western Australian Department of Agriculture.

In 1955 an important change took place in the set-up of the advisory services. Several district officers were formed at strategic centres in the cereal and sheep and dairying areas of this State. At these centres offices were built and all the personnel of the Department in an area brought together.

Such a centre was established in Narrogin. Much advisory work is done from the office by letter, phone, and visits from farmers. There is a small library and equipment for testing salt in water and soils. The staff at this office today consists of two agricultural advisers (including the officer in charge), a soil conservation adviser with a technician, a weed control officer, a stock inspector, three vermin control officers, a fruit fly inspector, and a typist. The duties of the office are both advisory and inspectorial. However, it must be made clear that the advisory officers do not do any inspectorial work. There are now about 1,000 farmers per general adviser. Soil Conservation and other Divisions increase the range of advice and services, but do not, of course, reduce the number of farmers served per general adviser.

TABLE 1

	1946/47	1960/61	Increase
No. of holdings	1,827	2,020	
Total area of holdings (acres)	3,590,500	4,641,000	29%
Average size of holdings (acres)	1,965	2,307	
Total area cleared (acres)	2,679,500	3,550,000	33%
Area cleared as % of total area of holdings	74.6	76.5	
Area of established pasture (acres)	312,700	1,483,800	376%
Established pasture as % of area cleared	11.6	41.8	
Area of crop (acres)	561,630	989,700	76%
Crop as % of area cleared	21.0	27.9	
Total number of sheep	1,106,800	2,524,700	128%
Sheep per cleared acre	0.4	0.7	
Average wool weight/head (including lambs) lb	7.4	10.2	38%
Total number of cattle	12,780	26,230	105%

It is interesting to note the progress the Narrogin District has made since 1946, demonstrated in Table 1.

GROUP EXTENSION

The main methods of extension used in Narrogin since the appointment of an adviser in 1952 and the formation of the district office in 1955 are the group methods. In the early fifties one agricultural adviser had more than 2,000 holdings in his district. Thus he had little hope of contacting many farmers if he had to rely on individual visits.

The formation of 'pasture improvement groups' made his job very much easier. The first was formed at Miling in 1939. Following its success, the next six groups were formed in 1947. The first group founded in the Narrogin district was at Wickepin in that year. Since then about sixty such groups have been set up in the cereal and sheep areas. In this district we now have seven groups. It is through these groups that the adviser has been able to get an introduction into a district. This movement is non-political and has no commercial interests. The main aim has been to encourage farmers to sow improved pastures, particularly subterranean clover. Field days are arranged by the district adviser on members' properties to show what has been achieved. These days have been very popular and are arranged for travel to different parts of the district each year. At Wickepin 250 people attended a field day. The average attendance at thirteen field days in 1961 was about 70.

Other activities of the groups are the running of pasture, ley-farming wheat crop, and fodder conservation competitions. These competitions all played an important part in encouraging members to sow more pasture. The district adviser generally judges these competitions and it enables him to make contact with a lot of farmers.

These groups have been of great value to the farming community and to the creation of goodwill between the Department of Agriculture, the adviser, and the farmer. Before the formation of the groups most farmers were rather distrustful of members of the Department visiting their properties. Now an adviser is welcome when visiting a member. They have also been a great help to the Soil Conservation Service of the Department. Conservation advisers have always attended meetings and field days of the groups and explained the principles of soil conservation.

The pasture groups are a most useful vehicle for group extension. They provide a framework within which experimental and demonstration work can be readily organized, and groups of farmers gathered together in a receptive frame of mind. The work of these groups has obviously been a great success. In the Narrogin district almost one and a half million acres of additional improved pasture have been sown in the lifetime of the groups. Sheep numbers have greatly increased and better farming methods adopted. Group members have always been willing to try out new ideas, and the results of research. They are now thirsting for knowledge and often know the results of research work before the adviser hears about it.

Talks are given at night meetings of pasture groups, Farmers' Union branches, Junior Farmer clubs, and others, usually illustrated with coloured slides. These are most popular with farmers. Each district office has a 35 mm camera, projector, and screen.

The Department's film unit also occasionally holds evening shows. These have so far been of limited value though, as more suitable films become available, especially those on local topics, these functions should become more useful as an extension medium. At present coloured slides shot locally by our own staff are more effective. However, the film evenings do provide an opportunity for farmers (and their wives) to meet their advisory officer. Very useful contacts are often made during these evenings.

INDIVIDUAL METHODS

While I agree that individual farm visits are the most effective means of extension, they are very costly and time-consuming. Many individual visits are made following up pasture group activities or to seek cooperation for conducting trials or arranging meetings. During the last two or three years there has been a trend for advisers to spend more time doing experimental work, rather than making individual visits. However, if visits are not made to farms one quickly gets out of touch with farmers' problems.

The experiments are designed with a view to their value for group extension. Attempts are made to solve district problems or to find out the agricultural potential of new areas. This work is usually done on farms in collaboration with a research Division. Narrogin is equipped with a 12-run disc drill, trailer, and land-rover to avoid having to use farmers' seeding equipment. Cereal, pasture, and animal work is carried out.

MASS METHODS

Opportunities for using mass media are somewhat limited. There is no radio station originating broadcasts in this district (though one other district has and is making use of a local station). However the A.B.C. in Perth is most cooperative and is used for making occasional live broadcasts and to advertise field days, meetings, and local items of interest. Narrogin with its town population of 5,000 has only a weekly paper. There is little editorial interest in agricultural topics and only occasional use is made of this outlet.

PAPER 39

WORK AND METHODS OF A DISTRICT FARM ADVISER

By W. M. JOHNS*

The Ulverstone district is possibly the smallest farm adviser's district in Australia. It is roughly 25 miles square and comprises 300,000 acres, of which 62,000 acres are sown to improved pastures and 30,000 acres to various crops. Because of its small size it is not a typical district, but the methods used are typical of those in general use in Tasmania.

There are 885 rural holdings in the district, of which 35% are less than 100 acres and only 7% are more than 500 acres.

Rainfall varies from 37 inches per annum on the coast to 55 inches in the highlands at an elevation of 2,000 ft above sea level. Apart from a narrow strip of sandy loam on the sea coast, the principal soil type is a fertile red clay loam derived from basalt.

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* Tasmanian Department of Agriculture, Ulverstone.

Primary production is intensive and varied. The majority of producers are engaged in 'mixed farming'. Animal production includes dairying, fat lambs, wool, beef, pigs, poultry, and bees. As many as five or six of these enterprises may be carried on the one farm. The main cash crops are potatoes, pulse, and vegetables, with smaller areas of cereals. There were 80 spray irrigation plants operating in 1960/61. Forage crops are grown extensively, the main types being oats, rye corn, turnips, swedes, rape, kale, and chou moellier, with smaller areas of maize, Japanese millet, and fodder beet.

THE EXTENSION SERVICE

The District farm adviser's office and home are situated in Ulverstone, which is located almost in the centre of the district and is the main market town.

He is thus no further away than a local telephone call from any farmer in his district. This is an important factor increasing the effectiveness of his work.

Other extension workers in the district are an assistant farm adviser and a dairy officer. Ulverstone is one of four districts in the North West Region, which is supervised by a Senior Extension Officer. Regional specialists include a veterinarian, sheep and wool officer, piggery officer, two horticulturists, and two agronomists.

The district advisers carry out all field work for the Agricultural Bank of Tasmania and the Closer Settlement Board. This entails the supervision of their 79 properties in the district. Applications for loans are investigated and, if approved, the expenditure is supervised. Although this work takes up about one-third of their time, it has many advantages as they are kept up to date on all aspects of farm management, development costs, land values, etc.

Individual Extension Methods

The farm visit must always remain an important aspect of a district adviser's work, although not necessarily the most effective one from the viewpoint of the district as a whole. Requests for visits are usually of sufficient number to obviate the necessity for free lancing. It has been found that any spare time is more profitably used in the organization of group and mass methods.

The Telephone.—The telephone, although it can be a curse at meal times and at week-ends, is the cheapest and fastest aid used. For specific advice, e.g. the recommended sprays for weeds or pests, it is invaluable, requiring little time and no milage.

Office Callers.—One day a week is set aside exclusively for office interviews. This is on sale day, when all other jobs, except the very urgent, are secondary to the office caller.

Farm Visits.—Some discretion is used in regard to farm visits. For instance, the man who rings up and asks for a visit to determine if his hay is ready to bale is told that the adviser is too busy to provide that type of service. Advice on the problem is given over the telephone and the farmer encouraged to use his own initiative.

Unless the matter is urgent, visits are not made until a day's work accumulates in a particular locality. Up to five visits are made in one day, the important thing being to get away from the office early and complete two visits before lunch, commencing at the property furthest away and working back towards headquarters. The office staff telephones the farmers beforehand, making the appointments. Requests for farm visits include many from new settlers. Visits to these farmers frequently lead to requests for complete farm management programmes.

Farm Management Programmes.—These entail the drawing of a sketch plan of the property and a written programme, usually covering 5 years. This details the treatment for individual paddocks, the proposals regarding livestock, cash crops, and fodder conservation, and includes budgets of receipts and expenditure.

These programmes are time-consuming and there is a limit to the number that can be handled effectively. There are 34 such programmes in operation in the district at present. The procedure has been speeded up by making the farmer responsible for the drawing of the sketch plan and preparing the budgets, after discussion. The detailed programmes are made out for each year, during a farm visit, on a pad with a carbon copy. From the carbon, the adviser's office staff types the programme on a Farm Visit Record Card.

Farm Visit Record Cards.—These are kept for all properties visited and record the details of the visits. The adviser is able to refresh his memory as to previous advice given. Last financial year 260 individual farms were visited for all purposes, including Agricultural Bank work, by the two advisory officers. The total number of visits was almost 700, or an average of nearly three per property. This indicates the impossibility of visiting every farm in the district every year.

Mass Methods

There are still some farmers who have no desire to be visited by the farm adviser. However, many of these are undoubtedly influenecd by group and mass methods. They read the agricultural press and listen to rural broadcasts, and much of their information is received 'over the fence' from enlightened neighbours. The more cooperative farmers, of course, are also influenced by mass methods which, because of their very wide coverage, have an important place in the farm adviser's programme.

Radio.—Reasonable facilities are available for radio talks on the A.B.C.'s country breakfast session and on a commercial station at Burnie. These sessions are used to broadcast information on topical subjects such as outbreaks of pests and diseases or on seasonal farm operations.

Press.—Once each year a seasonal review is written for the Ulverstone Show Supplement in the regional newspaper. In this an attempt is made to cover all the latest agricultural developments.

The same newspaper readily prints talks given at field days and farmers' meetings and this facility is exploited. There may be only 12 farmers at a meeting, whereas the printed talk may be read by hundreds. The paper also produces a weekly 'Man on the Land' supplement. The journalist responsible keeps in regular touch with the district adviser in search of suitable material. Property write-ups are a feature and by suggesting suitable properties the adviser is able to focus attention on progressive methods.

Group Methods

Group methods have proved very effective. They also make a significant contribution to both individual and mass methods. For example I doubt if I have ever attended a farmers' meeting or a field day without receiving a request for a farm visit from a new contact.

Farmers' Organizations.—Although Ulverstone is a small district, there are nine branches of the Farmers' Federation and six Junior Farmer Clubs in it. Most of them are glad to include a talk or a film show on the meeting agenda. If an invitation is not received inside a reasonable period, a circular letter is addressed to all branches advising that a new agricultural film has been received, or a talk illustrated by slides is available. This is usually followed by an invitation to the next meeting. Colour transparencies are useful for this work as an interesting talk is provided with the minimum amount of preparation.

Meetings.—Some centres have both a Junior Farmer Club and a branch of the farmers' organization. Meetings are often combined. In addition to business meetings, the adviser attends social functions, such as balls, dinners, and ladies' nights. He often shows films of general interest as well as agricultural. He not only gets to know the farmers and their sons but also their womenfolk. By influencing the leaders of the groups, he is able to influence every family in the group. Last year a total of 787 farmers were contacted at 49 meetings, excluding social functions.

Field Days.—A recent innovation has been the organization of field days on a group basis. Each group is encouraged to hold its own, and these are called 'driveabouts'. The executive officers and the adviser do a tour of members' farms and arrange a varied and interesting programme. Specialists are co-opted to assist in the discussions.

At one such field day recently the following items were inspected and discussed:

A pasture fertilizer demonstration
The district's top dairy herd
A land development project
A new elevated herringbone cow-shed
A special-purpose pasture on swampy land
A new-type pig-fattening sty

General field days are also held wherever suitable material is available. Last year 9 field days of all types were attended by a total of 714 farmers.

Farm Demonstration Plots.—When agronomists established the fact that potash deficiency is a limiting factor in pasture production, farmers were urged to lay down their own plots. In my district no such plots were laid down by farmers until the district advisers laid down a series of demonstrations throughout the district. These have been responsible for a spectacular rise in potash usage. Wherever possible demonstrations are laid down on roadside paddocks where they attract maximum attention from passing farmers. At present there are 19 demonstrations of all types current in the district.

Competitions.—Since 1947 a district fodder competition has been conducted each year in association with the local Show Society. This is a most comprehensive competition, including most aspects of farm management. Entries average 20 per year. Many farmers welcome the opportunity of discussing their problems with the advisers during judging. At the conclusion, a comprehensive report is forwarded to each entrant including any suggested improvements.

The district adviser is a member of the general committee and of the executive committee of the Show Society, which is a fruitful field for extension contacts.

Other competitions organized include fat lamb competitions, baconer carcass competitions, barley-growing competitions, and potato-growing competitions.

Farmers' Schools.—The latest development in group activities has been the organization of farmers' schools on a district basis. This type of school was formerly conducted on a State basis, at the Cressy Research Farm, covering a wide variety of subjects such as dairying, fat lamb raising, poultry farming, pig raising, shearing, farm welding, etc. These courses varied from one week to eight weeks' duration and some difficulty was experienced in getting farmers to attend.

District schools are arranged for the slack season for the particular industry. They extend over only 1 or 2 days, in a central hall, the farmers returning home each night. Lectures are illustrated by slides and films, and adequate discussion periods are provided for farmer participation. Attendances have been encouraging, over 80 farmers attending one recent school on dairying.

CONCLUSION

Agricultural extension must use a variety of methods in an attempt to achieve maximum effectiveness. In the Ulverstone district, group methods have proved effective, achieving the happy medium between the slow, but sure, individual methods and the faster, but less thorough, mass methods.

It is considered essential for the district farm adviser to live and work in the closest possible contact with the farmers and all others associated with primary production in his district.

SECTION IV A

Farm Management Extension; Role and Significance of Commercial Firms and Private Advisory Services, including Farm Management Clubs

LIST OF PAPERS

PAPER NO.

47. Farm Management Extension in New South Wales. *By* P. C. Druce.
48. Some Development in Farm Management Extension in Victoria. *By* D. R. Meadley and B. F. McKeon.
49. The Effect of Integrating a Farm Management Advisory Section into an Extension Service and some Empirical Case Results. *By* J. D. McAuliffe and A. A. Dawson.
50. Farm Management Extension in Tasmania. *By* N. A. M. Kjar.
51. *Withdrawn.*
52. District Agronomist Participation in Farm Programme/Management Services. *By* I. McLean.
53. Farm Management Appraisals and Competitions. *By* K. M. Sillcock.
54. Farm Management Clubs. *By* H. P. Schapper.
55. The Bombala District Rural Advisory Service, Bombala, N.S.W. *By* N. J. Douglas.
56. Rural Advisory Groups in South-western New South Wales. *By* A. C. Sundstrom.
57. Method of Development of a Farm Improvement Programme as Applied to an Advisory Service in the Wagga Area. *By* H. Hassall.
58. Farm Improvement Clubs in New Zealand. *By* A. H. Hughes.
59. Private Consultants in Agricultural Extension. *By* C. I. A. Beale.
60. The Development, Organization, and Problems of a Private Pastoral Consultant Practice. *By* I. L. Johnstone.
61. Experience of a Departmental Officer now in Private Practice. *By* J. P. Makeham.
62. Private Enterprise Advisory Services in Tasmania. *By* D. Berry.
63. *Withdrawn.*
64. Extension Work in Seed Marketing. *By* M. V. O'Reilly.
65. The Role and Significance of Commercial Firms in Extension Services. *By* S. H. Langford.
66. The Australian Fertilizer Industry's Contribution to Agricultural Extension. *By* G. W. Hexter.
67. Role of Agricultural Extension Officer in Industry. *By* A. N. Johnston.
68. *Withdrawn.*

REVIEW

By H. P. SCHAPPER*

The 19 papers in this section of the programme deal with farm management extension in State Departments of Agriculture, Farm Management Clubs, private consultants, and the role of commercial firms in extension.

Farm Management in State Departments of Agriculture (Papers 47–50, 52, and 53)

It is clear that in the Departments of Agriculture of New South Wales, South Australia, and Victoria there is, in the words of P. C. Druce, 'a new phase in the evaluation of farm extension in Australia. The plan now being implemented envisages that extension services in farm management will be integrated with the State's (New South Wales) existing technical extension services, thus broadening the scope and function of the Department of Agriculture's Service . . .' Further, 'the need for farm management extension has now been recognized in New South Wales and a start has been made to provide specifically for extension in farm management'. In this State recognition 'involves the appointment of a trained agricultural economist to each of the Department's nine extension regions, together with in-service training in farm management techniques for all technical extension officers'.

The need for economic information to 'complement that which is available on technical aspects of production and so enable due weight to be given to economic considerations' is acknowledged also by the Victorian Department of Agriculture, and D. R. Meadley and B. F. McKeon list the Department's methods and show how they are intended to be used in farm management extension.

In South Australia there has already been set up, within the Department of Agriculture, an economics section 'to act in much the same way as any specialist branch. It is the function of this branch to provide district advisers with a continuous stream of economic data on production costs, and financial returns for different kinds of crops and livestock in various parts of the State'.

Finally, the whole-farm approach has long been the 'model on which farm management extension has been practised in Tasmania'.

Thus, farm management extension has been recognized by most Departments of Agriculture in Australia. In each of the papers reference has been made to the need for special in-service training for this work and to the idea that the general extension officer needs to be given some training in farm management economics.

The papers by I. McLean and K. M. Sillcock deal with experiences in their respective Departments of Agriculture in farm management extension. McLean's experimental experience is similar to that of a farm management club adviser and it leads him to conclude that there is likely to be an increasing demand for the farm management club type of advice and advisers. Sillcock's experience with farm management appraisals and competitions is similar to that of advisers who have the time to calculate 'all possible numerical expressions of farming efficiency', to walk over the farm, and to discuss with the farmer in detail. He recognizes the whole-farm approach, but leads one to speculate as to whether the value of competitions which are based on it is to be found more as in-service training than as assistance to farmers.

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This group of papers records recent and intended changes in Departments of Agriculture — towards farm management extension. There is recognition also of the associated problems of the shortages and training of staff and the need to acquire different information.

Farm Management Clubs (*Papers 54–58*)

The paper by N. J. Douglas presents an outstanding record of success of the first farm management club adviser in Australia. From 150 to 400 bales of wool and 200 to 900 head of cattle on the one property in 10 years is pretty good and one cannot but sense Douglas's modesty when he says, 'the over-all reaction of members to the acceptance of advice has been satisfactory'.

The two advisers of the Wagga & Districts Rural Service have each presented a paper. Between them they stress the whole-farm approach, discuss their method of initiating their service, come down heavily in favour of the degree man rather than the diplomate, and would like State and Commonwealth federations of clubs.

New Zealand's experience is given by A. H. Hughes from Massey College and at once gives credit for the beginnings of the farm management club movement to Lincoln, the rival college. (It should be noted that the movement in Australia is a direct copy of that in New Zealand.) He points out that the shortage of suitable advisers has held up the formation of clubs, there is no salary differential for degree and diploma men, that there may be an inherent weakness in the way clubs are at present organized with respect to career and salary opportunities, and that so far the movement has had only short-run success. But Hughes concludes that their success is due in no small measure to the fact that a need exists for this type of advice and that it is being met by the movement.

It can be correctly said, I think, that farm management clubs fill a need and will increase in number, and that the current barrier in Australia is the scarcity of suitable advisers.

Private Consultants (*Papers 59–61*)

In his paper, I. A. Beale gives a full statement on private consultants in agricultural extension. He defines these people as those 'not in government employ, who are engaged in extension to the individual farmer'. He sees that gaps must of necessity exist in government extension services and that if they are to be satisfactorily filled 'active encouragement' is necessary. This leads him to call for a survey of the consultant movement, changes in university training, the establishment of training cadres for extension officers by Departments of Agriculture, and the registration of consultants.

The papers of I. L. Johnstone and J. P. Makeham describe their professional experiences in private practice. Johnstone contrasts the private consultant with all other advisers and believes that the farmer can cover a wider field. But many of his points displayed an unawareness of the work of most club advisers.

Makeham really established his own farm management club and consequently has become aware of the difficulties of formation. He observes that farmers in the club appear to be of above average ability, considers that a university course in farm management is a necessary element in training, appears to consider the need for definitions of extension and national interest to be irrelevant for private extension work, is aware of the value of user-paid fees in attitudes to advice, and, because he obviously enjoys his job, understandably wants more people like himself. 'Government-run technical services will undoubtedly be needed just as urgently in the future as they are now, but an even more urgent need is to make a large-scale attack on the serious lack of business thinking which is widespread on our farms . . . it seems as if the private practitioner will be the only person available to do this. It is in the interest of agricultural efficiency, as well as that of the profession, that their activities be considerably expanded and encouraged.'

Commercial Firms (Papers 62, 64–67)

From a survey of agricultural extension by commercial firms in Tasmania, D. Berry concludes that, although in firms there are more than 400 persons who give advice to farmers, there is very little overlap between the Department of Agriculture and private enterprise. In fact he desires closer liaison between firms and the Department for the 'mutual benefit of themselves and agriculture'.

S. H. Langford also calls for closer liaison between the Departments of Agriculture and firms and would like to see some joint extension work. But he seems to exaggerate the significance of commercial firms in extension when he says that they 'may perhaps be in the most favourable position of all extension services, if only for the reason that any work of this nature that they do has to be beneficial — if not, sales suffer'.

A. Nelson Johnston deals with the trained extension worker in industry, whose aim is to tell rather than sell. And he shows that industry can be an attractive environment for the professional extension officer.

In his paper on extension work in seed marketing, M. V. O'Reilly nicely brings out the extremely specialized knowledge required by advisers in this field.

G. W. Hexter gives an account of the extension work of fertilizer companies and there would be wide agreement that the 'Australian fertilizer industry has played a significant role in agricultural extension throughout Australia, not only in the initial period of pasture improvement, but also in the more highly developed areas where considerable effort is still expended in the dissemination of agricultural knowledge and liaison between research extension organizations and the farming community.

Paper 54

FARM MANAGEMENT CLUBS

By H. P. Schapper*

The establishment by farmers of farm management advisory services is the newest development in agricultural extension in Australia. This development has already influenced Departments of Agriculture in most States, which traditionally have been responsible for agricultural extension. Establishment is fastest in Western Australia, where it may now be said that it has developed into a movement. From the formation of one club in 1958 serving 40 farmers, there were 10 clubs by the end of 1961; and by the end of 1962 there are likely to be 15 clubs in that State, servicing over 600 farmers.

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FORMATION AND STRUCTURE OF CLUBS

In Western Australia a farm management club consists of 40–50 farmers, from whom an executive committee is elected annually. The club is incorporated, and each member is legally bound to membership and the payment of the subscription fee for a minimum period of three years. The club employs its own expert adviser, to whom it pays a salary, travelling expenses, and superannuation. The fees paid by each farmer are decided upon by the executive committee, usually on the basis of size of farm by area, and there are usually three size categories. The fee ranges from a minimum of £50 per annum in some clubs to a maximum of £200 to £300 in others. The adviser is responsible to the executive committee. Conditions of appointment set out the hours of work, salary, increments, travelling allowances, holidays, superannuation, and so on. Details of these may be seen in the Handbook on Farm Management Advisory Services published by the Federation of Farm Management Advisory Services of Western Australia.

Initially, to form a club took from two to three years from the time when an interested farmer first got the idea until such time as an appointment was made. A major difficulty of formation was that the farmers who were interested did not have first-hand experience of the movement which they were endeavouring to initiate. These farmers had to persuade others to join them, a case of the blind leading the blind, and this may account for what may appear to be a long time in the formation of a club.

Persuading other farmers is not only a matter of educating them in the expected merits of such a club; it is also a matter of meeting violent and irrational criticism. This criticism is often strong and emotional, charging these clubs with 'socialism' and with the idea that farmers will loose their decision-making functions. However, as clubs have been formed, the time between the inception of the idea in one district and the formation of a club there tends to be reduced because most of the existing clubs have accepted the responsibility of helping a new club to come into being. Chairmen and secretaries of established clubs spend a lot of time in helping the formation of a new club.

A noticeable feature of the type of farmer who joins these clubs is that he appears to be a superior farmer. This observation has not yet been tested, but there is an hypothesis which may serve to explain it. These farm management advisory clubs, for the first time, provide farmers with an opportunity to organize an institution whose sole function is the betterment of management. There are no other such institutions in existence. Pasture improvement groups and agricultural bureaux are concerned with only one aspect of management. Farmers' Union groups are concerned with politics. Only farm management clubs are concerned with management of the whole farm. This is seen as a challenge by the keen farmer who can, for the first time, feel that in a farm management club he has an opportunity to associate himself with other farmers, and with an expert whose major and primary purpose is simply good management.

This appears to explain why executive committees of farm management clubs consist, almost without exception, of first-class people. It should become more widely known that these keen farmers generally have a broad vision, a keen sense of fair play, and are generous-minded. They appear to constitute an enlightened section of the farming community from whom professional employees would have nothing to fear in their personal and occupational relationships.

The advertised salaries for these positions have been at £1,900 to £2,500 up to £2,750, plus superannuation and travelling. Despite salaries which appear generous, it is difficult to get suitable advisers, and the difficulties of getting them are going to remain for some time. The reasons for this may be doubts about the conditions of employment. The written conditions include a 40-hour week, three weeks annual leave, sick leave (no less than that in industry), superannuation (5% of salary contributed by each party), milage (at least at Civil Service rates), reasonable allowances for attendance at Department of Agriculture field days, and so on. Despite these conditions, applications from experienced people have not been forthcoming.

QUALIFICATIONS AND FUNCTIONS OF ADVISERS

In Western Australia most of the advisers have come from New Zealand. One reason for this is that the salary position there is widely known to be inferior to that in Australia, notwithstanding the exchange rate. Another is that Australian degree courses up to the moment have not catered particularly well for the work of farm management advisory services. Also the New Zealand Diploma of Agriculture, together with the Diploma in Valuation and Farm Management (which is also taken by some New Zealand degree men), is in some respects superior for this type of work. From this statement it must not be inferred that the Hawkesbury, Dookie, or Muresk Diplomas are on a par with these qualifications from New Zealand. They certainly are not.

Also, in New Zealand there has been about 12 years' experience of farm management clubs. It may not be widely appreciated by university staffs or students that the establishment of clubs in Australia may constitute another worthwhile professional opportunity. Associated with this is the likelihood that university students entered faculties of agriculture expecting to be employed in a Department of Agriculture, C.S.I.R.O., or perhaps a business house, bank, or industrial firm. Up to now, no one at the time of enrolment had thought of private practice. However, now that positions in private practice and farm management clubs are developing, their popularity with university graduates may increase.

The appointment of non-university people to these positions has given rise to considerable criticism, particularly in Western Australia. Speaking as the advisory member of every subcommittee which has made an appointment so far, everyone can be assured that in every case farmers have appointed the person who appeared at the time to have been the most suitable for the position. So far, only two degree men have been appointed. This is unfortunate, but it is not the fault of the farmers. The degree men who have applied, and in many cases there have been quite a large number, have, without exception, been inferior to other applicants. There are extremists who consider that any person without a degree should not be appointed. The results from at least one club, which has been going for three years in Western Australia, give the lie to this way of thinking. The degree in agricultural science is not a sufficient condition for these positions, nor, as the degree is at present constituted, can anyone say with certainty that it should be a necessary condition. In New Zealand there are clubs with diploma men as advisers and others with degree men. Differences in results between these clubs have not been attributed to the formal qualifications of advisers. There are persons who have said, either appoint a degree man or let the club lapse. In Western Australia results are already showing and certainly will continue to show this to be a ridiculous view.

A more important criticism however is the claim that farmers who join these clubs lose their decision-making functions. This shows misunderstanding of the function of the farm management adviser. His function is not to make the decisions. They are made by the farmer. The farmer accepts responsibility; that is, he accepts the consequences, whether they are gains or losses. All that the farm management adviser does, and that is a big task, is to help the farmer to clarify his goals, to select the best means, and to make better decisions than he would otherwise. Even though some of these decisions may be the same as those without the adviser, it is hypothesized that the farm management adviser is able to inspire the farmer — the decision-maker — with confidence. In other words the adviser can reduce uncertainty. Even though some decisions may be exactly the same, this reduction of uncertainty of itself is a worthwhile function. Perhaps it will not be reflected in higher net returns, but it will certainly be reflected in peace of mind.

CLUBS AND DEPARTMENTS OF AGRICULTURE

What is the relation of the farm management advisory services to Departments of Agriculture? In the Western Australian Department of Agriculture the attitude at the executive level appears to be one of non-committal. In the field the position is different. Advisers on numerous occasions have stated to groups of farmers their willingness to continue to cooperate with them, and with club advisers, and these sentiments have been put into effect on numerous occasions in action. In the South Australian Department of Agriculture the position has been stated to be as follows:

> Any group contemplating setting up a club should be assured of continuing Departmental support on the basis that we see farm management clubs as supplementing existing services and in no way competitive with them.

Perhaps a more important question than the relationships of clubs with Departments of Agriculture is what effects may the farm management advisory club movement have on Departments of Agriculture? So far in Western Australia clubs do not appear to have had any influence on the Department of Agriculture.

In South Australia, introducing the general advisers to farm management work at the recent in-service training school was a wise move, in advance of the formation of clubs in that State. So far only one club has been formed there, but other groups are known to be interested. In that State the Department now insists that officers doing advisory work shall have some first-hand knowledge of, and practical experience with, the principles of farm management. Moreover, an announced intention is for that Department to build up a staff of economists and to place one at each main country centre. This has been the stated policy of the Department of Agriculture in New South Wales, and some economists have actually been appointed to these positions.

In Victoria a few years ago the Department assigned one of its general advisory officers to a group of dairy farmers. The intention was to see what farming changes this new form of organization (not a club formed by farmers, but a group selected by the Department) could effect on a group basis. This appears to be an outcome of the development of farm management clubs. These moves by Departments of Agriculture seem to be wholly good. Departments could supplement the work of farm management clubs.

What is the relation of the clubs to one another? In Western Australia each club is now the member of a Federation. The Federation at the moment is a paper federation in the sense that it has been little more than a clearing house for problems of superannuation and organization which are common to the clubs.

Some of the advisers appeared to believe that the Federation was an employers' body. They have formed themselves into an association and have held their own conference on technical matters.

Evaluation

Evaluation of the work of clubs has been provided for. Part of the activities of an adviser on taking up his appointment is to spend the first three months or so on a survey of members' farms. He is stationed at the University of Western Australia's Institute of Agriculture, where he makes up his questionnaire and analyses his data. A record of the results of each adviser's first survey is filed and it constitutes a datum line from which measurements of improvements in farm management, if any, may be measured. It is appropriate now to make an evaluation of the club that was formed three years ago. It is possible to match and to survey farmers outside of the group and compare directions and rates of change in management. The basic data for this study are waiting for research resources. Farmers and the advisers of these groups are aware of the desirability of evaluation and if anyone would like to do this task in Western Australia they would be welcomed by the advisers, the farmers' committees, and the University.

Club Developments

What are the future developments of the movement, in Western Australia at least? It is hoped that the Federation will employ a linear programmer whose major function will be to make generalized programmes with and for advisers. The adviser can then transform the general programme to a specific farm plan.

Budgeting thus takes on an entirely new role. No longer is it used for the discovery of the optimum plan. This will be found by linear programming, and the budget will be used to translate general optimum programmes to a particular optimum farm plan. Thus, farm management advisers will have a farm management laboratory paralleling the technical laboratory of general advisers in the Departments of Agriculture.

A second needed development is for the Federation to employ a liaison officer. Farm management advisers must have access to Departments of Agriculture, C.S.I.R.O., and the universities. Just as C.S.I.R.O. has liaison with Departments of Agriculture, so will liaison be necessary between C.S.I.R.O., Departments of Agriculture, universities, and club advisers. Twenty or fifty farm management clubs, acting entirely independently, could find that early access to experimental data would be facilitated by a permanent full-time liaison officer employed by the Federation.

The Other Farmers

It has been stated earlier that the farmers who are forming these clubs seem to be the better farmers. What about the others? As Departments of Agriculture will have fewer farmers to advise directly, they may be able to reallocate their resources. Whether it will be in the direction of more extension or more research, no one knows. Perhaps it should be in the direction of research. Despite their successes, Departments of Agriculture are not likely to be as effective in extension as groups of farmers who employ and pay their own advisers. However, it will be a long time before even a majority of farmers are paying directly for their advisory services, and it is clear that some Departments of Agriculture, through the employment of district economists, are keen to bring their advisers into farm management work. But the resources at their disposal are limited, and it is not likely that Departments will be able to offer a service as intensive as that received by members of clubs. There is little doubt that the poorer farmer is just as much, if not more, in need of the more detailed approach as the better-off farmer. But Departments of Agriculture are never likely to be able to cater to the same extent for the individual as the farm management club. This seems to be a basic and permanent difference. It is likely therefore that the other farmers will make do, as they always have. It is doubtful that more can be expected, even though Departments of Agriculture may organize themselves closer to these people's requirements.

Future of Departments of Agriculture

This raises another, but even more distant point. 'What of the Departments of Agriculture?' The establishment of more and more clubs will permit Departments to concentrate more than they have done hitherto on the determination of biological production functions, the lack of which is currently one of the bottlenecks for more efficient farming in Australia. For a long time agricultural economists have been pleading with Departments to provide more of these data of a specific kind. This is not to say that all research should be oriented in this direction, but many persons would like to see the resources which could be released from Departmental extension, now that there is an alternative extension service developing, used for speeding up the provision of functions which are basic for economic decision-making. For this sort of work Departments of Agriculture are exceedingly well suited. It is considered that the development of farm management clubs will increase not only the economic efficiency of farmers, but also will enable Departments of Agriculture to undertake work for which there is an increasing demand, and which can most appropriately be performed by them.

UNIVERSITIES

Another development that is needed is for universities to orientate their courses a little towards, or to make provision for, education for this type of extension work. There has been no education, and no need for any, for the sort of extension work which the Departments of Agriculture have traditionally followed. But farm management extension, which is detailed and specific and requires calculation, needs to be provided for in the degree course if degree people are to be employed in this sort of work, as they should be.

PAPER 47

FARM MANAGEMENT EXTENSION IN NEW SOUTH WALES

By P. C. DRUCE*

The introduction of farm management extension services in New South Wales this year marks a new phase in the evolution of farm extension in Australia. The plan now being implemented envisages that extension services in farm management will be integrated with the State's existing technical extension services, thus broadening the scope and function of the Department of Agriculture's service to the farming community. The purpose of this paper is to describe the steps now being taken to provide State-wide extension facilities in farm management and to discuss some of the problems likely to be encountered.

What is 'Farm Management'?

Perhaps the first essential in this paper is to clarify what the economist means by 'farm management', for, like so many other concepts, the term can have different meanings to different people.

Farm management is concerned with 'the business decisions which farmers have to make in order to achieve a balanced and profitable farming system. It concerns not only the technical aspects of growing crops and producing livestock, but also the selection of these enterprises and how big they shall be. Each of these aspects will be important for determining not only the net income of the farmer, but also the productivity of all resources within any country which are devoted to agriculture . . . farm management must also be the framework within which all agricultural teachers and advisers, whether specialists or generalists, who are to be successful must fit the advice they offer' (1). Heady and Jensen (2) consider that farm management is 'a practical study in a way in which the other fields (of agricultural science) are not. Instead of simply dealing with the facts of agricultural science, it shows how to put these facts to work on the farm; in short, farm management alone is interested in *profitability* . . . farm management is not only the practical field in agricultural sciences; it is also broader than the other fields, and must consider the findings of each in reaching its own conclusions. It takes the position of the individual farmer and considers the farm as a whole'.

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The Need for Farm Management Extension

The need for extension services in farm management has long been recognized overseas, particularly in North America and more latterly in Europe. In the United Kingdom an organized farm management advisory service was introduced in 1950. Farm management extension in some States of the United States dates back to early this century.

Perhaps because of the past inadequacy of university and agricultural college training in agricultural economics (a situation now rectified in two New South Wales universities, but not in its agricultural colleges), Australia has lagged somewhat in its recognition of the need for specialized advice in farm management, despite the fact that technical extension facilities have been so well developed. However, the need for farm management extension has now been recognized in New South Wales and a start has been made to provide specifically for extension in farm management.

Organization in New South Wales

The introduction of farm management extension in New South Wales follows an investigation of farm management advisory services in the United Kingdom in 1958. In a subsequent report it was suggested that a service patterned on similar broad lines to the U.K. service should be introduced in New South Wales when suitably trained staff became available (3). It is this suggestion which is now being implemented.

Initially it involves the appointment of a trained agricultural economist (Economics Research Officer) to each of the Department's nine extension regions, together with in-service training in farm management techniques for all technical extension officers. The first two regional appointments have been made, to Wagga and Tamworth, but owing to continued shortage of trained staff no further appointments are envisaged in the immediate future and it may be four or five years before economists are appointed to all nine regions. In-service training schools, each of 5 days' duration, will be held in the two regions to which appointments have been made this April and May; further schools are planned for other regions.

Regional Economics Research Officers will be attached to the Division of Marketing and Agricultural Economics and this Division will also maintain a nucleus of agricultural economists in Sydney, most of whom will be engaged primarily on research in farm management and associated subjects.

Organizing Farm Management Extension

Farm management involves the application of certain economic principles to agriculture and the use of recognized management techniques; however, it will be readily realized that principles cannot be applied nor techniques used unless certain basic data are available. Australian agriculture suffers — by comparison with countries such as the United States and Britain — from the past inadequacy of its research in farm economics; there is very little information available on costs and returns in farming and consequently it is often difficult to use techniques such as budgeting without first carrying out extensive investigational work to obtain the necessary basic data.

One of the regional economist's main functions will be to carry out the research work necessary to provide this basic data for as wide a range of farming types as possible. His second primary function will be to act as a consultant to the technical extension staff on economic matters and to assist in training and advising these officers in management techniques and in the application of economic principles to agriculture.

It is recognized that many extension officers have in the past given advice on management. It is hoped that, as a result of the appointment of agricultural economists to regions and the formal in-service training which is to be provided, technical extension officers will appreciate still further the need for a formal approach to management and also that they will appreciate more fully the need to assess the merits of any advice which may be given in economic terms as well as in its technical aspects. Is the advice being given economically sound in addition to being technically desirable? Is it not only profitable for the farmer to adopt the advice, but the most profitable course of action he can adopt? Farm management is concerned with techniques and with profitability; it is concerned not merely with whether a particular plan is profitable, but whether it is the most profitable plan which the farmer can adopt having regard to his financial status, his willingness or otherwise to take risks, his personal inclinations for leisure and responsibility, etc. Farm management is concerned with the individual farm rather than with farms in general and with the farm as a whole, not with one isolated activity. There is a severe limitation on the extent to which generalized farm management advice can be given; advice must usually be tailored to the individual circumstances.

The Time Factor

Because farm management extension is highly individual and frequently involves a detailed examination of the farmer's existing production plan and of his financial organization, it is, of necessity, time-consuming. Experience in farm management clubs indicates that one adviser can provide a complete technical and economic planning and advisory service to no more than 50 landholders. Where only spasmodic advice is involved a problem of, for instance, farm reorganization may involve several days' work by an extension officer. It is apparent, therefore, that if official extension services are to provide comprehensive farm management advice this advice must be given not only, or even primarily, by agricultural economists, but by technical officers who have been trained in farm management techniques.

It is not envisaged that regional Economics Research Officers will devote any substantial proportion of their time to providing management advice to farmers individually although it will be essential that they do this to a limited extent, if only to obtain necessary background and experience. It is hoped that over time technical extension personnel will, with the assistance of the agricultural economist, devote an increasing proportion of their time to providing farmers with management advice. However, it is clearly realized that this process may be slow and that progress will undoubtedly vary depending upon individual training and inclinations.

Group Approaches to Management

One final question arises directly from the time-consuming nature of farm management work. To what extent can a group approach to management problems be successful? It is suggested that, in the long run, much can be done to encourage individual farmers to apply farm management techniques to their own properties, with or without the assistance of their accountants or other financial advisers; this may involve training accountants in farm management as well as farmers and it will certainly require that adequate economic data be available, but given this latter condition it should prove feasible, using group extension methods, to educate some farmers to use appropriate management techniques.

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PAPER 57

METHOD OF DEVELOPMENT OF A FARM IMPROVING PROGRAMME AS APPLIED TO AN ADVISORY SERVICE IN THE WAGGA AREA

By H. HASSALL*

The Wagga and District Rural Service, hereon referred to as 'the Service', was formed in 1959 with a membership of 40 properties within a 50-mile radius of Wagga — a second group of 40 was formed in 1961. This paper, which deals with the activities of the former group, to whom the author is the agricultural adviser:

1. Outlines the author's method of development of extension within the Service with reference to extension techniques used and their method of application to individual problems
2. Draws attention to the need for an individual whole-farm approach as the most satisfactory extension method, with interpretation and application of research findings at the individual level

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SEQUENCE OF APPROACH

Initial Survey

Newly appointed advisers to a Rural Service usually have a limited knowledge of the district in general and of the management methods and personal problems of the individual properties in particular. The first requirement, therefore, is a substantially detailed survey of the properties. The initial survey at Wagga was concerned with gathering the following information:

1. A scale map of each property showing all natural features and improvements
2. Paddock records, giving super, cropping, and pasture histories
3. Cropping records showing five-year averages of acreage and yield of wheat and oats, details of new varieties sown, working and sowing methods, types of rotations used, and bulk handling methods
4. Stocking records showing five-year averages of sheep and cattle carried, sheep shorn and total pounds wool produced, ewes and cows mated, lambing and calving percentages, diseases encountered, fodder operations, and yearly stock management records
5. Complete list of plant
6. A schedule listing the main problems encountered by members and their particular aims in development of stock and agronomic enterprises

Results of Survey

Analysis of data from the initial survey shaped the extension approach used in the Service. The data were broadly analysed to determine the main problems of members and the variation in individuals' past performance.

Members listed their main problems as those of management methods and techniques within enterprises. Those of an agronomic nature took first preference, with greatest confusion centred on types of rotations to employ in cropping, species suitable, establishment methods, areas of various pastures required, and rates, time, and frequency of application of superphosphate in pasture extension. Generally, problems of stock management received second preference and within these enterprises there was wide acceptance of traditional methods. The adviser was provided with a host of information. Variation in property size, climate, and managerial ability pointed to the necessity for an individual approach. Maximum nett profit was agreed to be the motivating force on each property, but the effort which individuals were prepared to make to achieve this end varied. Suggestions of economic analysis and discussion of availability of resources were regarded with some suspicion at this stage. It was obvious that broad economic considerations would be best left to a later stage.

Following the survey period, the author visited the C.S.I.R.O. at Canberra, and the various Departmental Research Stations. An exhaustive analysis of available literature furnished a host of research data. These findings were mainly concerned with techniques and methods. There was a considerable lack of input–output data, which gave impetus to the need for an approach to methods within enterprises first and broader farm economics at a later stage when there were more individual records of an economic nature available.

The Agronomic Framework

The first stage of the programme for each property has since been called the agronomic phase. Several visits were made to each member to discuss all the available research findings on agronomic activities and to fit these into the member's programme where applicable.

In cropping enterprises, the system of crop rotation required most attention. Rotations were drawn up for each property showing the paddock to be cropped each year. Sowing rates and methods, varieties used, application of bulk handling, areas of grazing oats required, and other agronomic activities were also planned for each property. With pasture establishment and development, there was a need to appraise the whole programme from the economic viewpoint (e.g. super and sub clover on the hills or phalaris on a smaller area of the flats). It was necessary to discuss suitable species for various areas and establishment methods. Many individual trials have been put down and are still in progress on these problems. Superphosphate probably represents the biggest single item of expenditure on farms in the Wagga area. Research findings from C.S.I.R.O. have been adopted and rates, time, and frequency of application have been determined for each property. Finally, fodder conservation was examined to calculate drought reserves required and the level of supplementary feeding which could be economically undertaken. Hay, oats, and ensilage have been costed to determine the cheapest source of fodder available on a food unit basis.

All these factors were discussed and each member was provided with an individual report summarizing the main points of his programme. Each year since then the programme for the following year's cropping, pasture, super, and fodder has again been discussed with each member and revised where necessary.

Just what has this achieved?

The author believes that, individually, each member now has a basic plan of development encompassing the best agricultural and economic principles which can be brought to bear at this stage. The member in turn feels confident that his programme is taking advantage of the best research evidence available and is tempered by economic considerations. During the agronomic phase of activities, record-keeping of a dissection nature has been instituted on a variety of items, ranging from labour to paddock use, so necessary for later analysis. Trials have been established over a whole range of agronomic methods to determine the application of research findings at the individual level.

Stock Husbandry

Problems of stock management and husbandry were the next step in the programme. From the initial survey a productive ability schedule had been drawn up for each member, showing wool cut per acre, lambing percentage average, and stock sales for a five-year period. It became obvious from the variation between properties in similar areas that there was wide scope for improvement, e.g. the five-year average lambing percentage in the Service varied from 67% to 80%. Stock management bulletins were drawn up to encompass all applicable research findings within the sheep and cattle enterprises. These were discussed with each member and a diagrammatic stock year schedule drawn up depicting all necessary additional or changed techniques.

The three traditional concepts which had to be reviewed in the light of recent research were autumn lambing, spring shearing, and spring calving. There has been obvious reluctance to change traditional methods, but a number of members have instituted trials on these lines. In the sheep enterprise, use of ram harnesses and culling techniques, routine prevention of disease, drenching programmes, fleece weighing, lambing management, and nutrition have been discussed. Cattle improvement has been based on selection for weight-gain ability, routine prevention of disease, pregnancy testing and culling, and nutrition. Stock programmes are also reviewed yearly to bring in new techniques and assess the results of members' trials.

Each member now has a programme designed to increase his productivity in these enterprises. Results of this phase of activities have been more spectacular than the agronomic phase and results of trials have indicated the degree of changes required in traditional methods.

Economic Analysis

The author feels that the first step towards economic appraisal should start only after the adviser has a full appreciation of all the management factors, and has discussed techniques within interprises. There is usually a great need for further input-output data on all aspects of farm activities and, during the initial phases, the adviser can stimulate interest in the keeping of records so necessary for financial appraisal.

Economics in an advisory service is not a static research tool. It must be an active technique used to better the individual's financial results. The author, as a start to economic appraisal, has used comparative analysis. This comprises the financial results of groups of similar-sized properties in similar climatic areas.

A summary of assets and liabilities will be drawn up at the start and end of each year. Income and expenditure for the intervening period will then be analysed with the usual anomalies of depreciation, family labour, and so on adjusted. Finally an analysis sheet will be drawn up for each member, showing his figures, the average for the group, and the average of the three most financially successful in the group. The analysis sheet will show the proportion of his various assets per acre, his gross and nett income per acre, his total and operating expenses per acre, and, finally, his return to capital and management. As more records are kept, this will be expanded to include a comparison of the individual enterprises. With the collection of this information for several years, it should be possible to proceed to programme planning at the individual level.

It is felt that the financial appraisal will provide valuable information to the individual and the adviser. The individual will become aware of his positon in a similar group, while the adviser will obtain data on the financial imperfections of the weakest, and details of cost and expenditure as a prelude to budgeting for the more advanced.

CONCLUSION

The paper has presented an outline of the sequence of extension programme within an Advisory Service at Wagga.

Just what has the success of this programme contributed towards professional extension method? The author feels it has shown the need for individual attention on a whole-farm basis. There is a real need to group research findings relevant to certain districts under enterprise-improvement programmes. For this to be of greatest assistance, these methods require practical and economic consideration on a whole-farm basis.

What value have present research findings in this form of extension? There is a mass of research findings applicable to farm programming. However, there is a real need for more attention to their profitability on an input–output basis, if extension officers are to be able to give economic consideration to extension techniques and methods. This applies particularly to the major input items of labour, super, and fodder.

What future have Advisory Services in our present pattern of extension? The further development of Services since the formation of the Wagga groups points to the success of this method of extension. With the inception of economic analysis, the author feels that this type of Service will provide useful information ranging from input–output data to enterprise-combination problems. With mutual cooperation from existing extension services, the two would have the complementary effect of providing an improved extension approach in this State.

PAPER 61

EXPERIENCE OF A DEPARTMENTAL OFFICER NOW IN PRIVATE PRACTICE

By J. P. MAKEHAM*

Over the past three years there have been numerous descriptive articles on the functions of private practitioners in extension. They all predict an increase in private practice.

It is also widely agreed that there is plenty of scope in Australia for the application of the 'whole-farm' economic approach in extension. It is almost certain that most of the increased demand for the services of privately employed advisers will come from farmers who want advice on farm management problems, in addition to merely technical advice. The increase in private specialist service is likely to be much slower, as such services are already provided by Government and industry.

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* Agricultural and Farm Management Consultant Service, Colac, Victoria.

The reasoning underlying the expected rise in private practitioners runs as follows:

1. Farmers will increasingly demand advice on matters affecting farm management.
2. To be done properly, such a service costs a good deal of money and needs skilled manpower (1).
3. Public funds will almost certainly not be made available to pay for this service (if they were suddenly made available, then the scope for private practitioners would be fairly limited).
4. Farmers are willing to pay for it, but are unlikely to be willing to pay the Government to run such a service for them.
5. Therefore, privately employed persons will come forward to meet the demand.

It is worth noting at this stage that qualified private practitioners should not be regarded as being inferior to Government-employed extension officers. Lawyers, doctors, and veterinarians are not so regarded by their Government-employed colleagues. (In fact, the reverse may be true!) Extension has been for so long an exclusive province of Government Departments, that some Government people (very few, fortunately) regard all newcomers to their traditional field with a mixture of hostility and moral indignation. This is perhaps an understandable reaction, but one which does not bear critical examination.

I have had the good fortune to have worked in extension and applied pasture research for the Victorian Department of Agriculture for five years, before commencing private practice over two years ago. The three main lessons of my service there were:

1. Knowing the physical and agricultural features of the district in which I am now working.
2. Learning the functions and staff of most of the many specialist branches of the Department.
3. Learning how to approach farmers and their pasture problems.

The district was large, and there were more demands for Departmental help than could be met. About half the field time was concerned with applied pasture research, the other half with pasture extension work. The bulk of the extension work was done in areas where growing grass was not simply a matter of putting on super. A typical farm visit involved a two- to three-hour discussion of soils, fertilizers, and pasture. The work was of value and was appreciated.

The farm management advisory work upon which I have been engaged for the past two years is very different. Any suggestion that such work 'competes' is without substance, as the following outline of the present work will show:

1. The clientele is different. Of the 45, only 15 had been visited by me as a Departmental officer. Nine had only been visited once.
2. Many of them live in areas where there are no fertilizer problems.
3. Their levels of intelligence, industry, and efficiency appear to be above average. Several outsiders have remarked that most of those who employ the service should need it least.
4. No more than quarter of each visit is spent on soil, fertilizers, and pastures. The visits are longer (4–7 hours) and more frequent (6–7 weeks).

5. The bulk of my discussions and office work involves such things as financial records, budgets, bank loans, lambing and calving time, sex composition of herds and flocks, food values and rations, stocking rates, profitability of various enterprises, percentage return to capital, and gross net returns.
6. The main emphasis is on financial, not technical factors.

RELEVANCE FOR TRAINING

A graduate who wished to do this sort of work, say two years after graduation, thus needs a special kind of training. He needs:

1. To know his agriculture. Experience with both practising consultants and/or with Government specialists can teach him this.
2. To know what is happening in research in the various fields which affect his advice, and also where he can find the answers to some of the many technical problems which can baffle him.
3. His university course to have grounded him well in the principles of agricultural production economics.

There would be a period of 6–9 months after graduation where he would not be earning much. A grant or a loan repayable over 10 years should help cover this period.

ASSESSMENT

Can it be argued that, in view of the current shortage of trained extension workers, private farm management advisory services with a necessarily small membership are wasteful of scarce manpower, not in the national interest, and that the manpower would be more gainfully employed in Government service? The following points are involved:

1. We have yet to define what is the 'national interest' in the matter of extension. I sincerely hope that this conference will define just what we are aiming at in this regard. Some relevant thoughts are:
   - *a.* Is it the economic advancement of the community as a whole, the farming community, or just segments of the farming community, e.g. the less efficient? The three ends have very different means.
   - *b.* Extension workers should be mainly concerned with technical and economic factors; they are not social welfare workers.
   - *c.* The definition of an extension policy implies the existence of a clear-cut, national agricultural policy. There appears to be no such thing.
2. Most Government district advisory officers spend a variable, but significant, portion of their time on applied research. This assessment is concerned only with their extension activities.
3. A comparison of the effectiveness of the visit, the amount of research done, the attitude of the farmer to the adviser, and the numbers dealt with, both before and after my beginning private practice, reveals the following:
   - *a.* There is not the slightest doubt that the farmers take far more notice of a farm management adviser, to whom they are paying a fee, than they took of me as a Departmental officer. One frequently gets the feeling that this is the only way to do extension work properly.

b. Much less pasture research is possible now. However, a good deal of farm economic data has been collected and analysed, and any findings of importance will be published. Thus, private practice does not mean that the consultant now contributes nothing to the sum of information.

c. I visited about 100 to 120 farms per year when in the Department, and advised on one or two technical matters at each. Now, I would average about 16 new clients per year for far more detailed 2-3 year farm management advice, plus another 25 casual (3-hour) calls, in my present job.

The average client employs me for 3 years and probably part-time for another 2 years.

d. The impression I was left with after making an average technical call as a Departmental officer was that I had done something of value, but that I had made no change in the way in which the farmer thought about and regarded his job and his problem.

With the present work, I can impart to my clients a way of looking at the business and technical aspects of their farms which they will retain long after they have dispensed with my services. The emphasis on financial, rather than technical matters, also makes the work more meaningful.

There is little doubt in my mind that my present extension approach will have the soundest long-term effects, and I see no 'national' or administrative reason why private management services can be called wasteful of scarce manpower.

Government-run technical services will undoubtedly be needed just as urgently in the future as they are now, but an even more urgent need is to make a large-scale attack on the serious lack of business thinking which is widespread on our farms. As mentioned earlier, it seems as if the private practitioner will be the only person available to do this. It is in the interest of agricultural efficiency, as well as that of the profession, that their activities be considerably expanded and encouraged.

FORMS OF ENCOURAGEMENT

Encouragement of farm management consultants by extension authorities would involve:

1. Registration.
2. Assistance with training.
3. Willingness to officially refer to a registered practitioner those farmers whose needs could best be met by comprehensive farm management advice.
4. The use of library facilities and publications, and participation in certain specified conferences and schools.

Broad economics of the payment by farmers for farm management advice in a high-rainfall zone are shown in Table 1.

TABLE 1

50 farms, 1000 acres, £40 W.I.W.O.—Total capital	=	£2,000,000
At £10 per acre per year—Gross revenue	=	£500,000
£7/10/- per acre per year—Gross costs	=	£375,000
Exceptionally well paid adviser, gross	=	£5,000
As percentage of revenue	=	1%
Cost per farm	=	£100

Paper 62

PRIVATE ENTERPRISE ADVISORY SERVICES IN TASMANIA

By D. Berry*

As it is believed there are no self-employed or farmer-group employed agricultural consultants resident in Tasmania, this paper is written about the commercial firms operative in Tasmanian agriculture.

The definition of 'extension' used in this context is: 'the process by which farmers receive advice and education in agricultural techniques and management'. Extension has been regarded primarily as an activity of Governmental authorities, and this is not surprising, as, in order to get farmers to use the services, it has been necessary to publicize extensively the services available to them. However, it has not been exclusively Governmental. Some fertilizer companies have for many years had sections devoted to extension and to dealing with problems of agriculture or of the technical service directly related to their product, or its supply (1). Personal communication with the people concerned indicates that they are not order-takers and, in general, should be regarded as full-time extension officers, though somewhat specialized.

If the subject is viewed with the above definition in mind, there are many people who may be regarded as participating in extension because at some time in the performance of their duties they give advice to farmers. This advice is usually confined to specific aspects of matters in which the adviser has qualifications mostly of experience, but sometimes academic qualifications also. To form some opinion on the size, activity, and scope of this advisory force, the author sent questionnaires to seventy-five businesses who buy from or sell to farmers within Tasmania. Questionnaires were not sent to banks as it was considered their advice would be of the general nature appropriate to any customer of a bank.

Four questions were asked:

1. How many members of the firm give advice to farmers?
2. What qualifications and experience have these people?
3. What is the nature of the advice sought and the scope of the advice given?
4. What reference is made to the Department of Agriculture?

No questions were asked concerning means of extension other than individual farmer contact. However, some replies indicated that firms held field days and initiated farmers' meetings. Equipment available for extension purposes included film projectors (slide and moving), tape recorders, and epidiascopes. Also mentioned was a refraction seismograph for use in advising on suitability of sites for dams. The various 'mass media' efforts of private enterprise are not considered, although an evaluation of their effectiveness, from any viewpoint, would make an interesting exercise.

Sixty-seven replies have been received and the information from them is given in Tables 1 and 2. It indicates that in these firms a total of 418 people give advice to farmers. All the 67 businesses who replied sell to the farmer and 42 of them also buy from the farmer.

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* Electrolytic Zinc Co. of Australasia, Risdon, Tasmania.

QUALIFICATIONS

Five of these people are university graduates, seven possess diplomas of agricultural colleges. The fields of finance, valuation, and real estate are covered by the qualification of membership of the relevant institutes. Quality control in the dairy industry appears to be well covered by the qualifications of the dairy factory managers' courses.

Probably the most complete coverage from the point of view of qualifications is in the machinery field, where a considerable number are qualified at the 'technician' level.

NATURE AND SCOPE OF ADVICE SOUGHT AND GIVEN

In general, the matters on which advice is sought fall into relatively few subjects, although many aspects of these subjects are covered. The subjects are:

1. Finance
2. Property
3. Marketing
4. Machinery
5. Livestock
6. Agronomy

There may be some relationship between any two or more of these. For example, finance may be linked with any of the others; livestock may have to be considered in relation to a particular property; machinery and agronomy can well affect each other. They are considered separately below.

1. Finance.—Firms may be the source of finance or may be intermediaries in negotiations with other sources, e.g. banks, insurance companies, etc. The likelihood of other particular sources of finance giving more favourable consideration to a particular proposition would be considered when advice is given.

2. Property.—Advice includes suitability for particular types of farming, possibilities for development, and problems of management, as well as value for subdivision for resale. Worthy of note is a managing director's comment: 'Uncertainty appears to be in the field of whether the property is worth the price or not and, in most cases, this ignores its productive value in the true sense of the property yield on capital and labour invested.' In this matter private enterprise and the Department of Agriculture are both capable of giving the required advice. Principals in four stock and station firms considered that the farmer approaches private enterprise for advice, rather than Government lending agencies, because it is the source of finance, and therefore the farmer considers it is the more interested party.

3. Marketing.—Of the 42 firms who buy from and sell to the farmer, 28 considered marketing as of major importance in their advisory service. Its effect is on the immediate, i.e. the current year's, income and the advice given is from experts

TABLE 1

NUMBER OF ADVISERS AND QUALIFICATIONS

Major activity of firm	Number of firms	University degree	Diploma	Accountancy Institute	Valuers Institute	Technician	Experience	Total
Stock and station	19	—	1	5	1	14	172	193
General and produce merchandising	20	—	1	6	—	—	110	117
Machinery sales	12	2	—	—	—	25	41	68
Fertilizer sales	4	1	—	—	—	—	7	8
Chemical sales	5	2	3	—	—	—	2	7
Food processing	7	—	3	4	—	5	15	27
	67	5	8	15	1	44	345	418

TABLE 2

NUMBER OF FIRMS GIVING ADVICE ON SUBJECTS WITHIN FIELDS

NO. OF FIRMS ENGAGED IN VARIOUS FIELDS							
FINANCE 24*	Property 5	Development 8	Stock 6	Taxation 1			
PROPERTY 13	Valuation 5	Finance 5	Purchase 4	Subdivision 3			
MARKETING 23	Storage and packing 6	Presentation 5	Quality control 6	Types of crops 22	Certification schemes 3		
MACHINERY 31	Buying 18	Service and maintenance 16	Operation 19	Hydraulics, inc. irrigation 11			
LIVESTOCK 17	Breeding 3	Stud stock 2	Type for conditions 1	Buying and selling 12	Wool 3	Finance 2	Veterinary remedies 5†
AGRONOMY 32	Fertilizer 24	Seeds 5	Weedicides and pesticides 22†	Pastures 2	Vegetables 2		

* This is the number of firms who have *stated* they *supply* finance.

† Supplemented by visiting officers who are usually university graduates.

speaking on their own subject. Advice rarely proves unprofitable for, although merchants are dealing in biological factors, as in other phases of agriculture, their experience mostly enables them to assess the results of the laws of probability. Market trends, developments in storage and presentation, and financial factors are among the matters considered and analysed before a personal judgment is given to the farmer who asks. The importance of advice on marketing cannot be too highly stressed because the private enterprise advisers are successful businessmen whose decisions have in most cases allowed and enabled them not merely to stay in business, but in most cases to expand into prosperous organizations. Advice given in this sphere not only affects current income, but is often the factor which determines whether long-term policy is successful or not.

4. Machinery.—This is a matter in which Governmental agencies have for some time shown little interest. This interest is increasing as is evidenced by the farm safety campaigns and by the Tractor Testing Station at Werribee, Victoria, but the overwhelming force in extension on this subject is in private enterprise. This is because, in this sphere, the answers given by private enterprise are more directly related to the questions usually asked by farmers ('How do I cut costs?'; 'How do I earn more?'), i.e. on how to maximize this year's income. Advice covers suitability and versatility of machines, assessment of the worth of a machine in doing a job, and information on running costs and trade-in value. Instructions on servicing of machinery receive considerable attention and, undoubtedly, instruction on operation is regarded as most important by any reliable agricultural machinery firm. Indirectly, a contribution to agricultural extension is made by advice to contractors on such matters as roadmaking, clearing, and dam-sinking. Hydraulics, i.e. the machinery side of irrigation, receives considerable attention and advice is sought on three aspects:

a. possibility of irrigation
b. design of layout and equipment
c. operation

5. Livestock.—This is a field in which, excepting for animal health, the majority of people who advise are in private enterprise. A comparison shows that private enterprise has 120 men advising in this field while the Department of Agriculture has 38. In the sphere of buying and selling fat and store stock, an agent's advice is particularly valuable. The advisory services of those firms who deal in stud stock and in wool are no less valuable, particularly from a national viewpoint. Expert employees attend stud sales throughout Australia and other experts, both local and imported, are employed for specific purposes, e.g. classing of flocks. An interesting sidelight in the stock field is that less advice is sought on veterinary matters than might be expected in view of the magnitude of other advice on stock. This is undoubtedly because of State activity in veterinary matters.

6. Agronomy.—Advice on fertilizers is often sought. This probably can be attributed to farmers' lack of knowledge in two fundamentals:

a. the function of various elements as plant nutrients
b. the concept of unit values

The field of agricultural chemicals is one in which private enterprise is very active. Frequent requests for advice are received, probably because many of the active materials are presented under various brand names and the products presented have varying results at times because of differing methods of formulation. Ethical considerations hinder the Department of Agriculture in making recommendations in such cases, and this leads to the information being sought from private enterprise, which has fewer of these inhibitions. As mentioned, veterinary products do not stimulate a similar demand for information. It is clear that in various aspects of the abovementioned subjects exist the basic requirements for agricultural extension, i.e. on the farmers' side, an acknowledged need for information and a willingness to accept it, and on the side of private enterprise, a conviction that it has the required knowledge and a willingness to impart it. A mutual trust and confidence also exists. Table 2 shows the number of businesses which have said they are asked for, and give, advice on the matters mentioned in the table.

The replies received show a unanimity in their opinions that there is only a little overlapping between advice by private enterprise and advice given by the Department of Agriculture. Also to be read, rather more clearly than 'between the lines', is a desire not to intrude into what might be considered Departmental territory. Considerable emphasis is given to the passage of information via the farmer-merchant-farmer relationship.

An important factor in Tasmanian extension today is the recognition by farmer, merchant, and Government officer that, in general:

1. The Department of Agriculture advises on long-term improvement and development.
2. Private enterprise advises on how to use this development to maximize the current year's income.

If the liaison which exists between C.S.I.R.O. and State Departments were to exist between Government and private enterprise, each would be enabled to appreciate further the role of the other to the mutual benefit of themselves and agriculture.

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SECTION IVB

Relationship Between Extension and Regulatory Services and Research–Extension Liaison

LIST OF PAPERS

Paper no.

69. Research-Extension Liaison Within a Department of Agriculture. *By* B. O. French.
70. Effective Communication Within a Department. *By* G. W. Gayford, K. M. Sillcock, and D. J. Myers.
71. Getting Research Results to Extension Workers. *By* S. L. Macindoe.
72. Research and Extension Liaison Within the Department of Agriculture, Tasmania. *By* H. S. Teesdale-Smith.
73. The Research-Extension Committees of the Murray and Murrumbidgee Irrigation Areas. *By* D. V. Walters and G. A. Crawford.
74. Experiment Stations — Their Role in Extension Work. *By* E. C. Powell.
75. Some Aspects of C.S.I.R.O.-State Liaison. *By* D. B. Williams.
76. Publications of the C.S.I.R.O. A.R.L.S. *By* K. Loftus Hills.
77. The Gypsum Project — A Case Study of Commonwealth-State Research and Extension Liaison. *By* J. C. Noble.
78. A 'Combined Operation' in Coastal Pastures Research and Extension in New South Wales. *By* W. T. Atkinson and W. J. C. Hudson.
79. Research Liaison Between Commercial Firms and State Departments of Agriculture. *By* G. J. Shanahan.
80. Research and Extension Liaison Relative to Animal Health between the New South Wales Department of Agriculture and Commercial Firms. *By* J. S. Healey.
81. Extension Services for Weed Control in South Australia. *By* A. F. Tideman.
82. The Contribution of Regulatory Officers to Extension Work. *By* G. W. Gayford and K. M. Sillcock.
83. Relationship between Horticultural Extension and Regulatory Services. *By* R. G. Kebby.
84. The Interrelationship of Extension and Regulatory Duties in so far as they Relate to Footrot Eradication in the Armidale District. *By* A. N. Harris.
85. The Relationship Between Extension and Regulatory Services. *By* W. S. Smith.

REVIEW

By B. O. French*

Agricultural industries hold a unique place in the community, for they are the only ones in which the community accepts the major responsibility for developmental and problem-solving research and for assisting individual businesses in day-to-day managerial decisions. Results achieved are usually assessed in terms of improved agricultural technology, but the social betterment of farm families is also frequently considered to be important. A concern that agriculture should accept new knowledge with minimum delay follows.

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Research, regulatory, and extension functions at one time rested in a single officer. Relatively recently, these services were separated, no doubt on the assumption that improved service would result from specialization. That this has been the case is beyond doubt. Nevertheless it has not been without cost and this session is concerned with the resultant problems. To appreciate the interrelationships of these services, it is necessary to examine the role of each.

Objects of Research

The primary object of research is the acquisition of knowledge and the basic value of an investigation is the extent to which it adds to the sum of knowledge. However, 'agricultural research' must be concerned with the agricultural industries and hence it is doubtful whether it can be concerned with knowledge for knowledge's sake. Agricultural research tends to be appraised in terms of the degree to which results bear on the solution of some practical problem and the economic importance of that problem. Research programmes thus tend to be orientated towards those problems with the greatest economic content. However, there is no justification for assuming that the greatest benefit will result from the solution of problems with a high current economic importance. Hence the special relationship between extension and industry creates a danger that a close research–extension relationship may channel research away from the most rewarding lines of work.

Research results are not 'new knowledge' until they have been published and research responsibility is only discharged when this is accomplished.

Although research may demonstrate a new principle with wide general application, further experimentation and trial is required to ascertain its practical and economic limits for the formulation of extension recommendations. This is frequently called applied research — its importance in getting into practice the results of fundamental scientific investigations by C.S.I.R.O., State Departments of Agriculture, universities, and commercial firms is frequently overlooked. Apparently it is regarded as being of less importance and as requiring less ability and technical knowledge, judging by salaries paid and the resources allocated to it.

Objects of Extension

Wolfe (1) drew attention to confusion concerning the objects of extension. A strict interpretation might be to convey knowledge from a source to those who require it. This involves much more than communication of research results and in practice the agricultural extension officer assists farmers through experience as well as knowledge. Extension objects will vary from farm to farm, district to district, region to region, etc. but ultimately the extension officer must translate information and action so that they will provoke an individual farm response. Much more than technical knowledge is required, including personal qualities akin to salesmanship and leadership and facility in the utilization of the various extension media or tools. However, his first requisite is knowledge and so the research–extension relationship is a critical determinant of his efficiency.

It might be asked whether it is in the community's interest that extension should become increasingly involved in sociological and welfare aspects and that agriculture should receive such special attention over and above that available to the general community. Its justification may be that improved welfare will bring improved technology, as has been demonstrated in certain depressed areas of other countries. Its place in the Australian scene certainly warrants examination.

If the extension officer is to accept responsibilities outside agricultural production, as implied in the welfare approach, his training should be expanded to include disciplines other than agricultural science, but the research liaison problem will be just so much greater.

Objects of Regulatory Services

If the object of agricultural legislation is to advance the interests of agricultural industries, then the regulatory services must have the same ultimate object as extension and research and their implications for farm management must be considerable. Nevertheless, it is frequently stated that the association of extension with law enforcement has reacted to its discredit — this needs proof.

While court action is an operational tool of the regulatory service, a law can only be effective when the majority give voluntary compliance. In the end, this can only be achieved through understanding and acceptance. It follows that education through extension must supplement the threat of court action, and this may be exercised by the regulatory service itself or by the extension service on its behalf.

Organization of Agricultural Research, Extension, and Regulatory Services

Agricultural research is undertaken by a wide diversity of groups including the C.S.I.R.O., the Bureau of Agricultural Economics, six State Departments of Agriculture, and seven or so universities. In addition, industrial organizations, particularly in the chemical industry, undertake specialized research.

In contrast, extension is almost entirely the prerogative of State Departments of Agriculture, although field officers may service a particular firm's product and other research institutions publicize their activities through mass media. The place and role of farm management clubs has yet to be fully defined.

In general, regulatory services are also the prerogative of State Departments of Agriculture, although in some matters, e.g. quarantine, they act as agents of the Commonwealth.

The large number of research organizations makes for a very complex research–extension relationship. Nevertheless, it is usually oversimplified as being concerned solely with C.S.I.R.O. research and Department of Agriculture extension.

This overlooks the important research contributions from other organizations, the key role of State Departments in research, and the importance of the research–extension relationship between States.

The Key Role of State Departments of Agriculture

The C.S.I.R.O. undoubtedly holds a very special place in public esteem such that C.S.I.R.O. contributions have overshadowed those of State Departments in the public mind (2). This dominance has important implications for research–extension liaison and the whole problem of improving agricultural technology.

The uniquely close relationship existing in State Departments between farmer, extension officer, and research worker is a pre-requisite for adaptive and applied research and this excludes other organizations, e.g. C.S.I.R.O., from successfully entering this field. The agricultural chemical industry recognizes the key role of State Departments, but there is a need for increased recognition by agricultural administrators, Commonwealth and State legislatures, and the community generally.

In 1959/60, C.S.I.R.O. allocated approximately £5.9 million to agricultural research from a total expenditure of approximately £9.5 million. By contrast all State Departments received £13.3 million from Consolidated Revenue and Loan funds to meet all their responsibilities. Thus State Departments as a group received only £2.25 for every £1 received by C.S.I.R.O.

The Research–Extension Lag

It is fashionable to refer to a lag between the knowledge held by research workers and agricultural practice and to imply that it is due very largely to inadequate extension services. There is little if any objective data to define the nature of the lag, or the kind of knowledge which is not put into practice. The proposition that husbandry should or could be improved has been confused with the proposition that there is a lag between practicable knowledge and practice.

There must always be some lag between the acquisition of knowledge by one group and its acceptance in practice by another — it is the role of the extension officer to bridge this gap.

However, a slow rate of adoption may be due to a wide variety of circumstances, including the farmer's financial, social, and educational background, his exposure to extension media, the degree to which the research is applicable without adaption, size of farm, the leadership and capacity of the extension service, the knowledge of the extension officer, and the type of information. Unaided, the extension officer cannot hope to maintain an up-to-date knowledge of all research bearing on his responsibilities. There is thus a need for a third group of specialists to interpret, select, and communicate. This group has existed in State Departments for many years as subject-matter specialists.

CONCLUSIONS

Research, extension, and regulation are interdependent and serve the same basic objects. As new knowledge, acquired under strictly controlled conditions, moves from the site of investigation to farm practice, increasing generalization and adaption must be applied. The fundamental research worker may evolve a principal which is generally applicable to thousands of farms, but the extension officer is concerned with its detailed application in business terms to tens of farms or even a single unit.

The process of adaption is one of increasing complexity, not simplification, and yet the allocation of finance to individual salaries and public institutions suggests the very opposite.

The community's interests in agricultural services are only served by improvements in agricultural technology and perhaps in rural welfare. The efficiency of the utilization of public funds should be assessed in those terms. Consideration of detailed extension processes and methods may, or may not, bring some improvements. This Conference has demonstrated that practising extension officers are generally quite aware of the important aspects of extension theory, but at this stage these are secondary to the broad relationships which research, extension, and regulatory institutions bear to each other. If the present allocation of national finance to agricultural services cannot be increased there is sound reason to examine the possibility that more effective service could be given by a re-allocation of finance to achieve a better balance between institutions undertaking basic research, e.g. C.S.I.R.O., and those which have the responsibility of adaption and extension.

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PAPER 71

GETTING RESEARCH RESULTS TO EXTENSION WORKERS

By S. L. MACINDOE*

Publication

In Australia the range of recognized scientific journals is now fairly satisfactory — see list of 'Books and periodicals on Australian agriculture and research' available from the New South Wales Department of Agriculture. The non-publication of research work of adequate standard is often the result of a personal weakness on the part of the research worker. It may also be due to a misconception regarding the stage at which publication is warranted. The publication of progress reports is important and may depend largely on suitable avenues of publication being available, e.g. Australian Horticultural Research Newsletters, etc. There is a vast amount of experimental results not classed as original research, which is not published and which is therefore not available to extension workers or to other research workers, who are later forced to repeat such investigations in order to obtain facts on which to base recommendations. Publication of results of such trials on a regional basis is surely warranted.

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On an Australia-wide level, the responsibility of getting research results through to extension workers is being handled in part by the C.S.I.R.O. Liaison Section through publications such as Rural Research in C.S.I.R.O. and Liaison Notes, both the general Series and Sheep Notes, the latter being particularly well regarded.

Within the States the various Journals of the Departments of Agriculture, though containing some original work, are concerned increasingly with the presentation of information for farmers. However, a significant proportion of investigational work carried out, for example, on State Experiment Stations does not fulfil the requirements of existing publications, nor is it written up in a form directly suitable for presentation to extension workers. When such results are of value they constitute a real problem to State Departments of Agriculture, and in New South Wales at least there is need for a separate section of the Agricultural Gazette devoted to such results and also to the more popular presentation of published research work. Consideration is being given to the appointment of a special science writer to help meet this need.

Several Divisions in the New South Wales Department issue monthly notes containing pertinent research information selected from both local and overseas publications. The specialist officers within a Division are particularly qualified to select research information which is of interest or has a direct bearing on problems in any part of the State and to channel this to the appropriate extension officers.

State Departments have a major responsibility to publish regional research information, but unfortunately most States are lacking in the staff trained to publish research results in a manner readily understandable by extension officers. Because of this the C.S.I.R.O. Liaison Section is entering this field further by publishing or assisting in the publication of research information on a regional basis. This is evident from the recent publications, 'Pruning the Sultana' and 'Soil and Pasture Research in South-western Australia', and also a projected publication on research on the Northern Tablelands of New South Wales. It may well be that a great service could be rendered by the Liaison Section by training or even seconding staff to State Departments in order to assist them with the publication of research information, both on a State and, more especially, on a regional basis. Research information published on a regional basis reaches the greatest degree of usefulness both to the busy extension worker and to the farmer. However well written it may be, an article in Rural Research or in Liaison Notes is likely to be thought too general in interest for the extension worker, immersed in the day-to-day problems of his particular district, to really arrest his attention. A factual publication dealing with his own district is of immense importance and interest to him.

A particular characteristic of the regional publication which makes it of special value to the extension worker is the fact that research undertaken by

C.S.I.R.O., by State Departments, or by the universities can be brought together and interpreted in relationship to local farming practice.

Library Services

In research–extension liaison, one major problem is the research officer who does not write, and another the extension officer who does not read.

A library can do much to help to reduce the ranks of non-readers. It is not sufficient for the library to be a repository of agricultural publications. One function is to kindle and encourage the reading habit in extension and research workers. The library of the New South Wales Department of Agriculture (staffed by seconded officers of the Public Library of New South Wales) tries to do this. It accessions literature at a rate exceeding 18,000 items per annum, and the rate of loans is in the vicinity of 32,000 items per annum.

A library 'search service' is available.

Monthly, the library prepares and circulates to all officers a 'Select List of Library Accessions'. The list groups items into convenient subject-matter classes, and gives details of newly received periodicals, pamphlets, and books available on loan. Another service is the maintenance and servicing of 381 mailing lists, each of these being for regular circulation of certain periodicals. The rate of movement of periodicals to officers in various parts of the State is typically 580 per week. In addition, some of the periodicals are acquired in sufficient number of copies to enable permanent location at a country office. There are also select collections of reference books at 73 country offices. These are additional to branch libraries located in various Divisions, Branches, Sections, the Agricultural Colleges, Research Institutes, Research Stations, and some of the Experiment Farms.

Personal Contacts

To extension officers, the spoken word is perhaps at least as important as the published statement of research. In Australia the form of organization of C.S.I.R.O. makes it particularly liable to isolation. Many of its Divisions are quite closely knit and, in some instances, situated in areas remote from the farming areas they are supposed to serve. This cloistered atmosphere may make for high-grade research, but it does not bring the research worker into close contact with the extension officer or the problems of the farming community. This defect has been offset in part by the creation of its Liaison Section and by the organization of conferences.

Numerous combined committees of C.S.I.R.O., university, and State personnel assist not only in the pooling of research information, but in the distribution of this either directly or indirectly to extension officers, e.g. the State Wheat Improvement Committee and the Coastal Pasture Research Committee.

Some specialist conferences organized through the Australian Agricultural Council are of importance in bringing together research workers and those engaged in the hurley burley of agricultural extension. Various schools and courses do likewise.

In the Division of Plant Industry of this Department a series of regional conferences has been conducted over the past sixteen years. Originally held at each Experiment Farm at intervals of a year or less, these are now conducted at approximately three-yearly intervals. All research and extension officers within the area served by the Farm or Station are required to prepare statements of the problems which exist in the region and of the research or extension work being undertaken to solve these. At the conclusion of the two-day conference attended by all such officers and by Head Office specialists, each problem is given a priority on a 1 to 6 basis and is allocated to a particular officer, whose responsibility it is to initiate action as decided upon. Such action may require the conduct of research on an Experiment Station or in the district, or it may involve the laying down of demonstration plots in cooperation with farmers, or perhaps only the conduct of a campaign through extension workers to implement existing knowledge. Such conferences have proved of the greatest value not only in defining the research and extension problems within each region, but also in bringing together the combined knowledge, experience, and points of view of specialist officers, research officers, and extension workers.

Field days and personal visits organized by C.S.I.R.O., by universities, and by Departments bring together research and extension points of view. It is rather frightening to think of what might happen to the rural research of C.S.I.R.O. in the absence of C.S.I.R.O. field days attended by extension officers and farmers, for it is on these occasions that the goose must lay a golden egg in a public and entertaining fashion if it is to survive. Similarly, field days of the Department of Agriculture must serve to highlight for research officers of C.S.I.R.O. the practical problems of the farmer and extension worker. For it is very often the Department of Agriculture which points out the problems and often too plans a research programme later undertaken by a university or the C.S.I.R.O., perhaps without even the need to recognize in publication the assistance so given.

PAPER 75

SOME ASPECTS OF C.S.I.R.O.–STATE LIAISON

By D. B. WILLIAMS*

In an effort to disseminate the results of research, a wide range of new Commonwealth–State liaison projects is being tried. Several of these are still in the experimental and evolutionary stage.

LIAISON PROGRAMMES

From C.S.I.R.O.'s point of view, much of our liaison work for the last decade has centred largely on publications written for extension officers and leaflets published cooperatively with State authorities. Other liaison techniques — technical conferences, newsletters, liaison tours, and evaluation studies — have also been tried.

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Most of the formal Commonwealth–State activities in which C.S.I.R.O. participates arise from the arrangements worked out by the Commonwealth and States to administer Australian agriculture within our Federal system, with its division of powers between the States and the Commonwealth. The Standing Committee on Agriculture of the Australian Agricultural Council provides means by which experienced experts in Commonwealth and States can collaborate in designing and implementing research or control programmes. These programmes often contain a substantial element of scientific liaison work. For example, the Standing Committee sponsors the Animal Production Committee, the technical conferences (of which this 1962 Extension Conference is one), and *ad hoc* committees of various kinds such as the technical committees on skeleton weed, pleuropneumonia, and fruit fly sterilization. Other formal liaison projects between C.S.I.R.O. and the States include the work of such committees as the M.I.A. Irrigation Research and Extension Committee and the Southern Tablelands Joint Planning Committee.

Research evaluation studies are another phase of C.S.I.R.O. liaison activities. These studies provide interpretations of the available research data and review its use in practice. They involve also some analyses of the institutions engaged in research and extension and of how these have influenced the dissemination of research results. We have moved towards such studies in Dillon's review of beef feeding investigations for the Animal Production Committee (1) and in Farquhar's review of the Southern Tablelands Regional Research and Extension Study (3).

THE NATURE OF LIAISON

Throughout all this liaison activity, the underlying problem is to assess and interpret before we disseminate. This is what scientific liaison aims at doing.

In the rural industries liaison aims at more effective communication, in the broadest sense of the word, between research and extension personnel. This effective communication is a mutual exchange of experience and knowledge. The extension officer points to gaps in knowledge, and feeds back to the research officer something of the problems encountered in interpreting and applying research results. The research officer brings new knowledge to bear on these gaps and problems which are revealed by extension officers in the course of their contacts with the farming community.

It follows that much of the significant day-to-day liaison work arises from informal personal contacts, based on mutual respect and understanding of the problems and point of view of the other party. Where these are inadequate, breakdown occurs, as has been recorded by the Forster Committee in its report describing the liaison problems of the C.S.I.R.O. and the Northern Territory Administration (2). But it also follows that the need for liaison arises not merely because of the concentration of the responsibility for research in a Commonwealth agency and for extension in State agencies. Even within an organization which is responsible for research and for extension, liaison problems exist. Indeed, by thinking of such a situation, one can come to recognize the true nature of the liaison problem, which is to assess and interpret before we disseminate. It is easy to miss the forest for the trees, and to become confused by the fact that in Australia this liaison activity must be accomplished between different agencies engaged primarily in research or primarily in extension. There is a danger that purely administrative problems of relationships between different institutions may cast their shadows over scientific liaison activities and mask their true nature.

LIAISON AND PUBLICITY

As C.S.I.R.O. attempts to meet its responsibilities to disseminate the results of its research, it constantly faces problems of unfortunate misinterpretation of the general statements it makes, as these statements are applied to the particular circumstances of individual localities. This is one of the main reasons for C.S.I.R.O.'s determination to work with and through the extension services, and others concerned with local problems, who can act as a filter and as an interpretative medium for the new knowledge provided from C.S.I.R.O. research. The emergence of problems such as these stresses the need for all those engaged in liaison work to have a capacity to come to grips with the intricacies of scientific methods and knowledge.

For it is not easy to assess and interpret before we disseminate. It is easier and therefore tempting to cast the new knowledge to the winds, through mass media, and let someone else work out the details of problems of application in each area. But such details of local application, taken together, add up to become the essence of the liaison problem — how to understand the interaction and relative significance of all those influences which bear on the application of research results under different conditions.

The real complex is encountered when interactions between different management problems on the same farm must be expected, and where little relevant knowledge of either is available. This applies to all those new advances which involve the farmer in changes in his management system — so that their use to him can be assessed only by the 'whole-farm approach'. Such problems are involved when new improved pasture species become available, e.g. *Sorghum almum* and stunt-resistant sub clover. Note, for example, the need for local information about responses to cobalt when recommending cobalt bullets: What is the cobalt content of different soils and plants in the locality? Is phalaris staggers a problem? What selectivity in cobalt intake exists between different plants? What responses to cobalt thereapy have been observed in animals? Is sub-clinical shortage of cobalt a factor to be considered? and so on, throughout the whole range of new research results.

These problems of interpretation and assessment lead us also to consider the effects of the social institutions through which these results are being disseminated. What will be the attitude of government agencies, commerce, and the rural community to each new research finding? These need to be anticipated and taken into account before a liaison programme is defined. The State extension services are a most important channel of information to the rural community, but must take their place among a wide range of other agencies, each bearing directly or indirectly on the communication of research results to the farming people.

It is in this complex of activities by different agencies, including governments, public services and statutory authorities, universities, commerce, and primary producer organizations, that C.S.I.R.O. takes steps to inform the public of its work. C.S.I.R.O. publicity about phosphate nutrition, *Sorghum almum*, peanuts in the Northern Territory, the Mansfield process, beef cattle breeding, and rain-making, to mention but a few examples, has presented special problems for the extension authorities. Such efforts as these to publicize news items about research programmes may conflict with other action being taken to disseminate results of these programmes. There are circumstances, of course, when publicity can be used as an effective liaison technique, to help extension authorities in bringing research findings to the attention of the public. But these occasions are rare compared with those when publicity for a project is sought for other reasons. By becoming a household word to the Australian public, C.S.I.R.O. has exposed itself to the danger of misinterpretation by working colleagues in other organizations.

But these conflicts should become fewer and fewer as more account is taken of the need for liaison with extension services. Active exchange of experience and interpretations is the essence of liaison. Just as new research findings should constantly query whether existing knowledge is the best available, so should extension officers constantly provoke research personnel by pointing to unsolved problems and to results which purport to be applicable in practice but are not.

But despite all this, advances in knowledge need to be encouraged, and it would be folly to allow liaison or dissemination aspects of research programmes to prejudice the freedom and scope given to individual research personnel. The development of a well rounded research programme involves participation by professional liaison specialists and it is they who should work with scientific personnel to interpret and disseminate.

CONCLUSION

Liaison should aim at taking its place as an essential part of the research programme. It can only do this when it has the same freedom, and standards of intellectual discipline just as strict as those applying to other scientists.

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Paper 81

EXTENSION SERVICES FOR WEED CONTROL IN SOUTH AUSTRALIA

By A. F. Tideman*

Since the introduction of hormone herbicides fifteen years ago, agronomists, plant ecologists, engineers, and chemists have worked together and established a new science of weed control. The knowledge available today has now far outpaced its practical use.

Weeds which have accumulated for many years are now a problem in every primary industry and there is urgent need for extension work to make this new-found knowledge available to every landowner. Fortunately, it is the individual who has most to gain from weed control on his property and any extension advances should therefore be acceptable to him. However, better extension methods are not the complete answer. A farmer, through laziness, thoughtlessness, or ignorance, can undo in one season the good work of his neighbours. Weed control is a community problem and therefore it must go hand in hand with a Weeds Act. Furthermore, the Regulations of any such Act must be practical and readily applied to the field problem if they are to be effective and if acceptance of technical advances is to proceed as rapidly as possible.

With this in view a new Weeds Act was introduced into South Australia and commenced to operate effectively in 1958. It endeavoured to support a practical approach to weed control by:

1. Ensuring that the administration of the Regulations remained solely in the hands of local government, which is the authority nearest the individual landowner and most likely to understand his problem and attitude. (By adopting this procedure the Act also ensured that the Department of Agriculture was largely free of regulatory work.) This has enabled extension services to proceed unhampered in the field.
2. Aiming at 'eradication' of certain weeds which were considered serious, but which had not gained a hold.
3. Aiming at controlling, 'in any way which will stop their propagation and spread', the majority of serious weeds now well established over large areas of South Australia.

Local Government Problems

Faced with the problem of initiating active weed control in their districts, most councillors at first felt the task was beyond them. The following reasons became apparent:

1. Most councillors misunderstood the aims of the Act and felt that while they had any noxious weeds at all on their own properties they could not morally enforce the Weeds Act on their neighbours.
2. Councillors could not see their way clear to appoint active authorized officers (inspectors). Although finance was blamed, facing the issue and obtaining a

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suitable man for the job has been the real problem. The Act gives a council adequate means for raising the finance.

3. Ratepayers were suspicious of the council's ability. This suspicion had been strengthened over the years when the old Weeds Act gave councils no practical support, but simply insisted that weeds proclaimed noxious be 'grubbed and burnt'; consequently the weed problems had become more and more serious.
4. Councils realized legal proceedings would eventually have to be taken against some landowners. They had not the confidence to take these measures because they knew the outcome would rest on control techniques which were unknown to them for many of the noxious weeds which they could see were problems in so many varied situations.

THE EXTENSION APPROACH

This situation created a need for action by extension officers in the Department of Agriculture, who have utilized the following programme.

The Group Decision

With each council, extension officers have first aimed at an active weed-control policy by seeking a group decision by the councillors. Once this is achieved, 'action' invariably occurs because of the strong feeling of responsibility engendered in the councillors and the legal weight their decision enjoys.

Three steps are taken towards 'motivation':

1. Weed-control officers first show personal interest in the problems of the district by calling on the clerk and the chairman of the council. Two or three calls are very often necessary before sufficient confidence can be gained for these key men to initiate the next step.
2. A weed-control officer is invited to the council to explain how the Act can be interpreted in a practical sense. At this stage all legal details are avoided. Some local problems are discussed and the next step suggested.
3. Weed-control officers carefully survey the district and submit a report suggesting a policy to be followed: what weeds should be tackled first; where they should be controlled; the equipment necessary; and so on. The details are submitted as a written report and the council is then left to make its own decision.

To assist councils to reach this point extension officers have been using the following 'aids':

1. Flow charts to illustrate responsibilities under the administration of the Act and a pamphlet titled 'The Weeds Act and You'.
2. Posters have been distributed for display in council offices. Some have drawn the public's attention to particular weeds, others to the service councils give for weed control.
3. Newsletters have been sent to councillors explaining practical interpretations of the Act and outlining work carried out in other areas.

Councils in similar topographical areas have been encouraged to form groups. Some of these groups share authorized officers and finance for weed-control work.

Others simply meet regularly to ensure their weed-control policies are in line and so avoid boundary differences. Where particularly difficult problems have arisen regarding finance or interpretation of 'control' measures, arrangements have been made for councils to confer with the Weeds Advisory Committee, a body appointed by the Minister of Agriculture to advise him on all matters relating to policy.

Council Action

Once a council decides to follow an active weed-control policy, the following steps are guided by extension officers.

1. The Appointment of an Authorized Officer. The person appointed by the council is aided by the following extension services.

1. On field days he accompanies a weed-control officer to see some of his ratepayers to discuss their particular problems. The council's general policy is also examined in the field.
2. He has the opportunity to attend a weed-control training school. Twelve one-day schools are being conducted in different zones throughout the State. The council clerk, chairman, and authorized officer are able to attend by invitation.
3. Two handbooks have been prepared and are used as reference books at these schools. These give example notices to be issued to ratepayers for all noxious weeds in all the different situations likely to arise. They also give information on weed control by farm management and chemicals for weed control, tables, charts, and details of where further information can be obtained. These books are not available to the general farming community.
4. The authorized officer is also encouraged to use a weed-identification service provided by the Department.

A private businessman has organized a professional service to councils whereby he and his staff act as their 'authorized officer'. These men are also given every facility the Department can provide and their service is proving extremely efficient and welcome for councils. His recording methods and legal background are valuable aids to the council's work. He now serves 24 council areas in South Australia.

2. General Public Relations with Ratepayers. Councils are encouraged to state their new weed-control policy in the press and by posted circulars. Also 'advice' notices have been prepared by extension officers on which the ratepayer is told of the noxious weeds on his property and invited to state the work he has done towards their control over past years and the work he intends to do for the next three years. Ratepayers who fail to acknowledge these notices receive calls from the authorized officer, who issues legal notices if no action results.

3. The Issue of Legal Notices. The council is now in an excellent position to take legal action where necessary. This is commenced by issuing a legal notice prepared by the local authorized officer, who follows instructions for each weed laid down by Departmental weed-control officers. He has reference to these in his handbook. Departmental officers take no part in the action.

RESULTS

Daily reports compiled by extension officers engaged in this programme have enabled progress to be assessed. This is summarized, in Table 1, for the 100 district council authorities in South Australia. (No details have been compiled for the 43 municipal councils which in general have only minor noxious weed problems.) It is evident therefore that over a two-year period the number of active councils has improved by 17%. This is excellent, having in mind that the Department only employs three officers specifically for this purpose. These three extension officers have between them spent 250 days in the field with council officers each year for three consecutive years. Councils have also received more or less spasmodic assistance from 10 district agricultural advisers.

TABLE 1

Date	Number of inactive councils (no decision)	Number of active councils	
		With limited results	With excellent results
Dec. 1959	46	32	22
Dec. 1961	29	35	36

At the time of writing there is also considerable evidence that active councils are bringing pressure to bear through local-government channels on neighbouring authorities who are not facing their responsibilities.

The Department of Agriculture's weed-identification service has given further evidence of the results being achieved by this extension programme. Each year approximately 500 specimens are examined and advice given for control if the plant is a weed species. During 1959 only 6% of specimens forwarded came from council offices. During 1961 the proportion increased to 20%, reflecting the increased activity of council authorized officers and the increased confidence in them from ratepayers.

SECTION V

Programme Planning

LIST OF PAPERS

PAPER NO.
86. State Extension Programme Planning in Tasmania. *By* C. A. Holland.
87. Programme Planning. *By* B. D. Ament and J. N. Potter.
88. Involving Farmer Groups in Extension Through Planned Programmes. *By* B. D. Ament and J. N. Potter.
89. The 'Development' Phase of an Extension Programme. *By* K. M. Sillcock and K. E. Flynn.
90. Defining and Planning for an Extension Problem. *By* W. J. Wilkie and C. S. Bungey.
91. Extension Should Start Where the People Are: Case History of Miabest Oranges. *By* D. V. Walters.
92. The Yass Valley Study as a Background to a Planned Extension Programme. *By* R. W. Shelley.

REVIEW

By J. N. POTTER*

Mr. Maunder's lucid exposition of the rationale and methodology of programme planning is particularly appropriate at this time. In recent years some of us have become aware that lack of planned programmes is the most serious deficiency in Australian extension services. I thank Mr. Maunder for his guidance: he draws on unequalled experience in this field and has impressive ability to convey his knowledge to others.

All extension services and extension workers plan — some in more detail and more systematically than others. But in this country very few units of the extension services have systematically studied the needs they should meet, and the resources available, then listed long- and short-term objectives and prepared a work plan to achieve them. Still fewer units of extension services have committed programmes to paper and used those programmes as bench marks for self-evaluation. Many extension workers refer to their 'programme', but in most cases they use the word in a much more limited sense than it is used in the papers under review.

There are probably many reasons for the failure of Australian extension services to develop programme planning as it has been developed in some other countries.

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* New South Wales Department of Agriculture.

It is significant that Mr. Holland (paper 86) describes the adoption and development of planned programmes by a new extension service in a very difficult situation. Under such conditions an examination of needs and resources and a plan to use the available resources as effectively as possible in meeting the most urgent needs is now an obviously desirable course to follow, but at the time Tasmanian extension workers adopted planned programmes they were ahead of nearly all other extension services. Similarly, other States, when faced with an emergency, have shown willingness and ability to adopt State or regional plans of the campaign type to meet the situation.

However, the fantasy with which Mr. Holland commences his paper is unfortunately not fantastic at all. The situation described arises in services where planning, reviews of plans, and evaluation of results are not the practice.

It may be necessary to stress that readiness to adopt extension programmes or campaigns in times of emergency should not lessen our belief in the need for planning at times when the difficulties are not so obvious: to quote Mr. Holland, 'the need for Extension Programme Planning is probably greater than ever before'. An extension service without clearly defined objectives and a programme to meet them can be little more than a 'question and answer' service, led by the difficulties encountered by farmers instead of itself providing positive leadership for the producers it serves. Sporadic campaigns, even if well planned, do not make a planned programme and, in any case, to be really effective a campaign on a particular issue should be in planned relationship to other objectives of the service.

The Tasmanian paper is mainly concerned with planning as a means of achieving objectives. The paper implies, rather than states, the importance of planning in making the best possible use of resources. At State level the resources of men and money can be used most effectively if there is a State plan. At regional and district level the use of officers' time, travelling funds, and aids should be similarly planned.

The effective use of the extension resources of the region is one of the objectives of the project reported by Ament and Potter (paper 87). The other objective, and the major one, of that project is:

> 'To exert more influence on the pattern and methods of agricultural production by concentration of extension efforts on a limited number of high-priority objectives and on planned, selective use of extension methods.'

The paper was written in February, 1962. In July, officers of the Western Agricultural Region met to review results achieved in 1961/62 and to re-draft objectives and prepare work plans for 1962/63. The review meeting indicated faster progress than expected in the development of full understanding of the need for programme planning and towards implementing the future steps listed in the final paragraph of the paper.

The authors believe that, although they should be able to improve them, the methods used to introduce programme planning to extension officers in the Western Agricultural Region were basically sound. In that Region, planned programmes are now an established working method and will continue to improve with the guidance of the Regional Supervisor. It is our intention now to attempt to stimulate the adoption of similar systems of programme planning in other Regions of New South Wales.

The discussion in paper 87 briefly mentions the importance of written programmes as a starting point for evaluation. This aspect has not been given sufficient prominence in the paper. The first of the future steps listed in the final paragraph is more systematized collection and study of background information, prior to drafting objectives. The authors believe that it is desirable to have officers working to a work plan even if, in the first year or two, the plan is based on objectives drafted without sufficient study. The belief has been supported by the more detailed study of objectives (including surveys to collect information) by officers of the Region in 1962.

Paper 90, by Messrs. Wilkie and Bungey, deals with the definition of an extension problem on Kangaroo Island. It is a report of work in progress: one assumes that an extension programme will follow when the data-collecting stage is completed. Paper 90 indicates the amount of work that may be involved in data collection before the extension objectives can be clearly stated.

Mr. Walters' paper (91) introduces two other aspects of programme planning — the participation of farm people in defining and listing objectives, and the research implications of some of the objectives that may be listed. Involvement of farm people in extension programming will be referred to later in the review. At this stage I would like to draw attention to Mr. Walters' illustration of the value of close association of research people with extension programming. It is too easy to overlook the importance in extension of the flow of information from the farmer to the research worker, with the extension officer helping in identifying and defining problems and advising on their priority in the research programme: extension should be a two-way or cyclic process.

Papers 90 and 91 describe the collection of background information for limited extension programmes or for campaigns as components of wider programmes. In the Yass Valley Study described by Mr. Shelley in paper 92, a much more expensive and detailed study has yielded background material for broad research and extension programmes. Mr. Shelley's frank discussion and Dr. Farquhar's appended summary of replies to key questions to people concerned in the project help us to assess the potential value of similar studies in other areas. I have no doubt that similar studies would be of great assistance to extension officers in defining their objectives and determining priorities.

The experience in the Yass Valley should facilitate future studies. But we cannot wait for surveys of this type. The study of existing data, supplemented in the first place by small surveys by extension officers and later by more comprehensive studies, will have to be the basis for programme planning.

Messrs. Sillcock and Flynn in paper 89 raise some issues, for example the country adviser's duties, that are marginal to the topic of programme planning. I wish to draw attention to two aspects of the paper: the first is what the authors describe as the 'cyclic process' in extension — a fuller statement of the process mentioned by Mr. Walters:

'Recognition and definition of a farming problem
Investigation of possible solutions, including the activity usually described as "research"
Development of the solution to the point at which it can be used satisfactorily by farmers
Advisory work, including publication of the new knowledge and demonstration of its application on the farm'

The authors remind us that difficulties in, or resulting from, the application of a new technique, often lead us to the 'recognition and definition of a problem' stage again. The second point, arising from the first, is the recognition of the role of the extension worker in helping identify, define, and allot priorities to research problems.

We should now return to the need to involve farm people in extension programme planning. In paper 91 Mr. Walters explains the involvement of farm people in all stages except the research stage. In the work described in paper 90 Messrs. Wilkie and Bungey have involved the farm people in a less direct way. In the Yass Valley project the farm people are being involved in the second, more intensive, stage of problem definition. In the planning procedure described in paper 87, farm people are not directly involved in the initial stages, but in listing objectives officers are influenced by needs lists and priority ratings determined by Agricultural Bureau branches: these lists arise from programming discussions led by extension officers using modifications of the methods described in paper 88.

I do not intend to review paper 88 in detail: the procedure described is now well tested, well known, and in a modified form is standard procedure in many parts of this State. Attention should be drawn to point four of the discussion in this paper and the warning reiterated. If someone conducts a needs survey and discussion with a farm group he must first establish that he can guide the group at least part of the way towards satisfaction of the top-priority needs listed.

The following questions may provide a suitable basis for discussion:

1. Should we encourage extension officers to adopt comprehensive written programmes even though all the desirable background information is not available? Or should we encourage them to collect the information first?
2. At what stage should we involve farm people in the planning process — right from the start, or after we have got our planning system working?
3. How formal should we make the method of involvement of farm people in extension programming?

EXTENSION PROGRAMME DEVELOPMENT

By A. H. MAUNDER*

In June 1961 the Federal Extension Service of the United States Department of Agriculture organized a small conference on Extension Development Around the World (1). This conference was convened at the request of the International Cooperation Administration, the agency then responsible for technical assistance to other countries. About 20 people participated. They represented all levels of experience from the county to State and national leadership in our Cooperative Extension Service, and a combined experience of many years of service in other countries. I shall draw heavily from their thinking in this presentation. The following statement introduces the section of their report dealing with programme development and execution:

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> The success of the total extension education effort can be measured by the effectiveness of the program in rural areas. Organizing, staffing, training of personnel, and financing an extension service are means of establishing and carrying out rural educational programs.

In other words, we, as extension educationists, succeed or fail in proportion to the success or failure of the programme in rural communities within our respective areas of assignment.

Effective extension education requires planning at all levels — locally where rural people are directly involved, in the county, district, or other lowest level of extension organization, on a State-wide basis, and nationally. During the past few years, even international planning has come into the picture. The Food and Agriculture Organization of the United Nations is working at this level. In fact, I had the honour of serving as the first regularly appointed officer of FAO assigned to this area of activity in 1950. Regional cooperation in the development of extension or agricultural advisory programmes was a major activity of the Organization for European Economic Cooperation under the Marshall Plan beginning in 1949. The development or strengthening of rural institutions, with emphasis on extension services, has been a major objective of bilateral programmes of technical assistance of the United States and other countries. Sometimes, with today's emphasis on national development and international cooperation in attaining national goals, I fear we forget the function of the individual primary producer in economic development and of rural families in relation to social and political growth. More than 60% of the world's population still derives its livelihood from agriculture. Any improvement in national levels of living must certainly give primary consideration to this vast group. The economics of all countries must have as a foundation an adequate supply of food and fibre. This is especially true of developing countries, but equally those like Australia and the United States. Constantly increasing agricultural productivity is essential, not only to provide adequate nutrition, but for the generation of capital, and the release of manpower for other industries and services required for economic growth.

Emphasis presently given to extension education by nearly all governments is in itself recognition that economic and social development results from changes in the knowledge, attitudes, skills, and actions of millions of rural people. The heart of extension education is the local extension programme where people are induced to change. For this reason, I shall confine this presentation mainly to the development of extension education programmes at the county or district level, where education has its influence on rural people.

PHILOSOPHY OF EXTENSION EDUCATION

A review of papers prepared for this conference indicates a general acceptance of the idea that the central function of an extension service is educational. Its purpose as stated by Dr. Farquhar is to assist farmers, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural life. A weakness in practice concerns the words 'through educational procedures'. In my country, and I believe in yours, there is a tendency for extension workers to short-cut the educational process. We do things for people, e.g. develop farm management plans, rather than teaching farmers sound methods of planning. This is one reason we have never been able to implement a farm management extension programme reaching the masses of farmers. We tried to do too much of the job for them rather than teaching them to do the job themselves.

In summary, using the words of Professor Paul Leagans (2):

> The process of extension education is one of working with people, not for them; of helping people become self reliant, not dependent on others; of making people the central actors in the drama, not the stage-hands or spectators. In short, helping people by means of education, put useful knowledge to work for them. This process poses two overriding problems to any extension worker, (a) building a good programme, and (b) translating the plan into desirable action by masses of people who need to take action.

SOME ASSUMPTIONS AS A BASIS FOR EXTENSION PROGRAMME DEVELOPMENT

Modern procedures of programme development are based on a number of assumptions. Again I am drawing on Paul Leagans (2):

1. That prevailing conditions of living and ways of making a living are not what they ought to be and that something different can and should prevail
2. That it is possible to select, organize, and administer certain resources of technology, personnel, teaching methods, and physical facilities to help people achieve more desirable ways of living, and of making a living
3. That people need the guidance of professional leaders possessing the knowledge and skills necessary to help them learn to solve their problems.
4. That change is necessary; that change is a prerequisite to progress and that the status quo must be rejected, or at least modified, in favor of new ways of thinking and doing
5. That people will continue their present ways of thinking and doing until they have new experiences that cause them to reject present modes of behaviour and adopt new ones
6. That to cause people to accept new modes of thinking and acting requires greater incentives to adopt recommended practices than are offered by continuing with present ones
7. That progress is made only when someone has ideas about a better way and has the skill, courage, and opportunity to try them out
8. That progress requires change, but all change does not necessarily result in progress; it is change in specific, predetermined, and desirable directions that results in progress

9. That the most effective teaching and learning results from choice, not chance; from an intent to teach and learn under the most desirable conditions that can be created
10. That educational changes in people are prerequisite to the attainment of other changes in a free society — that changes in the mind and heart of people must come before changes are made in the actions of their hands
11. That the primary objective of extension programming and teaching is to help each individual, each family, and each community achieve the highest level of living that it is capable of, economically, socially, aesthetically, and morally, by means of aided self-help through education
12. That inducing people to adopt and continue using improved practices usually includes four major aspects: technological, economic, social, and educational; these areas are inseparably interrelated; to become widely adopted and used, a recommended change must be technically sound, economically feasible, culturally compatible, and educationally attainable

These assumptions frame the central task and paramount challenge to all extension workers. To induce rural people to attain, by their own efforts with a minimum of government aid, a position of better living is the central objective of extension workers. Obviously, the task involves at its core the problem of influencing people to think and act differently.

THE NATURE OF PLANNING

Extension programmes are created to bring about changes in people's knowledge, attitude, and skills. We hope these changes will result in improved living and in ways of making a living. This suggests that farming and living conditions are not what we would like them to be and that it is possible by appropriate action to change these conditions. This raises the questions from what, to what, by whom, when, and how much and by what methods. Decisions on these questions are the essence of extension programme planning. Abraham Lincoln, one of our greatest Presidents, expressed the idea very succinctly when he said 'If we could but know where we are now, and where we ought to go, we could better judge what to do, and how to do it'.

Effective extension programmes do not just happen. They have to be carefully developed. Planning gives meaning and system to our efforts and keeps them directed toward specific educational objectives. Without adherence to well conceived plans, there is a tendency for our programme to shift from education to a technical service in which we attempt to provide solutions to problems as they arise. It is doubtful if we will ever have the resources to provide this type of service to every farmer. Furthermore, it is hardly to be desired.

Planning of effective extension programmes is difficult because of the complexities involved. Programmes involve people, their needs, their resources, their interests, their customs, habits, and skills, their beliefs, their past experiences, useful technical information, and many other elements. But the development of a sound programme and gradual accomplishment of stated objectives can be very rewarding to the extension worker. Extension officers will probably never receive as high remuneration as some other professions, but in my opinion, there is no profession capable of giving greater personal satisfaction than extension education at the county or district level.

PROGRAMME PLANNING AND EXECUTION

Programme planning and execution cannot be entirely separated. Even the best of planners cannot forsee all the problems that may arise, the reactions of some people to suggested change, or changes in the situation that may develop before the plan is carried out. Programme revision to meet changing situations is an accepted element of the social action process. Nevertheless, the more carefully a programme is developed, the fewer adjustments will have to be made.

Good planning requires a number of understandings and skills:

1. An understanding of the purpose and nature of planning
2. Skills in developing procedures to fit the need
3. Skill in analyzing situations and identifying problems and needs
4. Ability to make decisions as to objectives and goals
5. Skill in formulating courses of action and in involving key people in the process

APPROACHES TO PROGRAMME PLANNING

The development of rural people implies a growing competence to deal with increasingly complex problems. One of the most important kinds of help given rural people in the United States has been an orderly approach to local problems. Programmes made *with* local people and dealing with local problems have largely replaced programmes developed by extension workers *for* local people. But this change in approach came about through several stages of trial and error on the part of extension agents, as well as educational growth of local people. In some respects this slow change was desirable. In my opinion, it is a mistake for extension workers, inexperienced in programme development, to attempt too complex a procedure. It can lead to frustration and abandonment of the whole idea when a simpler procedure leading to small success would encourage the extension worker to develop increasingly effective methods of programme planning. Rural people, who have been conditioned to accept instruction from an extension officer without question, may be slow to accept the idea of exhaustive situation analysis and appraisal of alternative courses of action. Often they would prefer to have the extension officer tell them what to do and blame him if his advice proved unsound. However, the wealth of accumulated research and experience should not be ignored. Procedures can be kept simple until personal confidence is developed by both the extension worker and by rural leaders.

In the early days of the U.S. Cooperative Extension Service, as in other countries, programmes were largely predetermined by professional workers in State and local offices. The wants and needs of farmers were assumed and programmes were centred largely on the best advice for controlling pests and disease, building silos, improving breeding stock, and other scientific and cultural matters. Early extension agents had large areas to cover and limited transportation facilities. Predetermined programmes reflected the direct interests of the colleges, but for some reason, farmers did not always adopt the recommended changes in practice.

The second stage of programme development centred upon the involvement of large numbers of rural people. Thousands of farmers and their wives gathered in small groups around kitchen tables and in school houses to tell the extension workers of their wants and needs. This was a significant step forward. It aroused the interest of great numbers of people never before reached. But after a number of years, the weaknesses of this plan became apparent. County programmes became long lists of miscellaneous unrelated projects. They were organized to meet many and varied requests from each community. Such programmes called for far more activity than the extension agent could carry out effectively. He spread his time too thinly among many insignificant projects and neglected many which were vital.

Fact-determined programmes were emphasized in the third stage of extension programme evolution. The influence of marketing conditions assumed an importance as great as production practices. Differences in rural and urban living were brought to the attention of rural people. Consideration of local, State, and sometimes national situations became more common.

The period of the 1930s brought on many national farm programmes developed to meet depression situations. Extension agents were often directly involved in administration of these programmes. In many respects, this was a reversion to predetermined programmes, justified or rationalized by the economic emergency. However, these programmes with their financial implications for the farmer were useful in the development of leadership. Most of them were executed through locally chosen committees, trained by the extension agent.

This development and use of local leadership continued and expanded through the World War II period. Without the educational influence of thousands of lay leaders, it is doubtful if rural people would have fulfilled their wartime responsibilities as effectively as they did. Today this system of lay leadership and advisory assistance has been extended to State and national levels. Nearly every State has an advisory committee, which meets periodically with the State Extension Director and his staff. Directors have found this mechanism useful in determining programme priorities and in informing lay people in State and national programmes and problems.

More recently the term programme projection has come into use. In essence this is an attempt to forecast direction of change in agricultural and living situations, and to plan programmes on a long-term basis. Through study of trends in production, consumption, and their effects on cost price ratios; through consideration of outside factors such as world competition, population movements, urbanization, and many other factors; through consideration of the increasing speed of technological change; it is hoped to assist rural people to adjust to the ever-changing situation. Agricultural adjustment is becoming an increasingly important element of extension education.

In summary, Paul Leagans has described three basic approaches to extension programme planning:

1. The autocratic approach where the extension worker determines what is good for the people. Predetermined programmes fall in this category.
2. The *laissez- faire* approach — This is largely a matter of following the course of least resistance. We have a lot of scientific information, so come and get it. Here are a collection of good farming practices. Won't you adopt some of them? We're willing to help you with any farm or rural living problem.
3. The progressive, democratic approach — This approach assumes that the soundest programmes result from a fusion of the ideas of many people — extension workers, technical specialists, farmers, and many others.

   It recognizes that programmes, to be effective, must be geared to the roots of rural problems and that no one can know the true character of these problems better than the one who has them. It implies going on the offensive and it involves leadership in pointing the way. It recognizes that professional people must lead their clientele to make up their own minds on the most useful targets or objectives and not make their decisions for them.

PROCEDURES IN PROGRAMME PLANNING AND EXECUTION

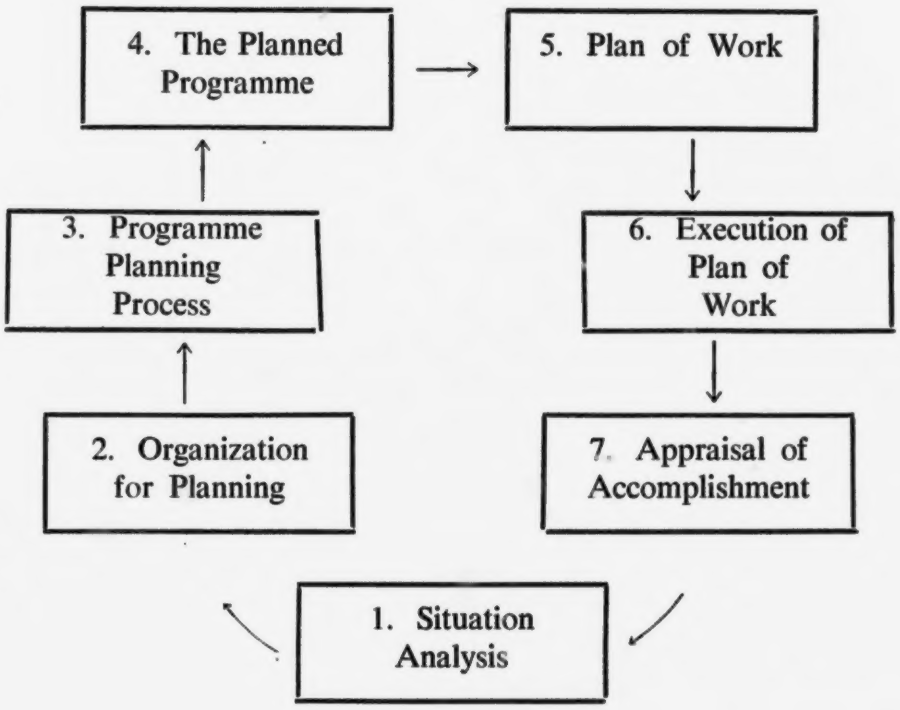
We have said that programme planning and execution cannot be entirely separated. They go on simultaneously to a great extent. The procedure for planning used may be quite simple in the beginning and elaborated as more people become involved. In any case, since programme development is a continuing and repetitive process, the procedure may best be considered a cycle involving seven essential steps (1). These steps are repeated in each cycle taking into account changes that have resulted in the intervening period.

The following is an idealized chart of steps in programme planning and execution arranged chronologically. In actual practice these steps frequently overlap. For example, an extension worker may have to proceed without certain information that would be useful in deciding on a programme. As more information is obtained, procedures and goals may be adjusted accordingly. Nevertheless, to the extent practicable, extension workers follow these steps:

Situation Analysis (Step 1)

All subsequent steps are dependent upon the situation. In fact, the whole purpose of extension education is to permanently change selected elements of the situation — farm income, family nutrition, rural leadership, and land use, for example. Those involved in planning the local extension educational programme need the best possible understanding of the situation with respect to the following elements:

1. Agricultural resources and current farming patterns and practices
2. Economic factors — credit, markets, price structure
3. Local culture — family system, needs, values, and desires
4. Socio-political system — formal and informal systems of government


4. The Planned Programme
5. Plan of Work
3. Programme Planning Process
6. Execution of Plan of Work
2. Organization for Planning
7. Appraisal of Accomplishment
1. Situation Analysis

5. People's abilities and individual resources — their skills, understandings, and intellectual development
6. National development programmes and goals
7. Channels of communication through which people obtain information, exchange ideas, and make group decisions
8. Other governmental and non-governmental development programmes which are active in the community, and the role of extension education in relation thereto

The key elements of situation analysis are sound information, problems, and resources. Those involved in building extension programmes start with a knowledge of these three elements.

Organization for Planning (*Step 2*)

Effective organization provides a means of involving people in the programme planning process. Involvement of people is a basic element of extension education. Participation helps to arouse interest, and those helping to determine a programme will usually do all they can to make it succeed. Involvement of people also results in better programmes. Successful programmes take into account local knowledge, habits, materials, and experience, in addition to the technical subject matter.

Extension education in a community, province, or country will eventually affect very large numbers of organizations, groups, and individuals. Not all of them can be involved from the beginning. A problem, therefore, is to determine whom to involve in the programme planning process, and by what means.

In general an extension worker will:

1. Identify and counsel with existing leaders, cooperators in previous rural programmes, and with individual citizens having useful knowledge or interests
2. Consult with other professional workers in agriculture such as planning committees, research workers, cooperative organizations, and administrators of programmes in related fields
3. Develop a formal or informal committee structure with which he will develop a programme of immediate and long-term objectives

Programme Planning Process (*Step 3*)

The ideal programme planning process includes a sequence of steps carried out in consultation with the groups and individuals previously mentioned. It is necessary to:

1. Identify wants and needs. Rural people are ready to undertake programmes which they believe will satify their wants, although they may not be aware of all their basic needs.
   Consult with specialists and other technically trained people. This will point up the more basic needs and ways of satisfying these needs. It is the job of the extension worker to bring this technical information to the attention of rural people for their consideration. This may cause people to change their minds as to what they want, and provide a basis for a sounder programme more acceptable to the people.
2. Determine relative importance of various recognized needs, and decide on priorities. This must be done in consultation with the people whose cooperation is required in conducting the programme.
3. Identify the problems or obstacles involved in satisfying the needs given high priority.
4. Determine possible solutions of problems or alternative courses of action. Solutions may come out of the experience of the people themselves or they may be suggested by the extension agent or specialist.
5. Agree upon objectives. This is a joint function of extension workers and the rural people involved. In order to be of value, objectives must:
   a. Identify needs and wants
   b. Specify the specific behaviour changes to be sought
   c. Identify the people involved, indicate the changes to be made and the subject matter to be used
   d. Be practical in terms of staff, materials, and other available resources
   e. Meet the test of most of the following criteria:
      Is the proposed change at the top or near the top in the recognized desires or needs of the people?
      Is it a change that is important to many?
      Will local leadership give full support?
      If carried out as recommended, is it certain to work?

Have 'off-the-farm' hurdles to success been cared for?
Is it practical and simple enough for people to adopt and carry out?
Is it practical and possible for professional staff to give adequate guidance?
Are the results readily observable and able to be accomplished within a relatively short time?

6. Prepare statements of objectives:
   For the persons or groups that were involved in determining the programme
   To incorporate into the written programme
   For use in informing interested and concerned persons and groups

The Planned Programme (*Step 4*)

A planned programme should be recorded in written form and copies made available to all cooperating groups. This is necessary to avoid later misunderstanding as to what was agreed and to serve as a criterion for measurement of achievement. A good written programme will normally contain:

1. The names of persons who planned the programme and the procedure followed
2. A situation statement of needs, interests, and identified problems
3. Statement of agreed objectives
4. Provision for coordination with other groups, agencies, and organizations

Plan of Work (*Step 5*)

The plan of work is a primary tool of the extension worker which he prepares for his own use as an aid in attaining the objectives of the programme. A plan indicates specific action to be taken, by whom, when, and where, and what accomplishments are expected. It includes a list of the required resources and how they are to be procured.

The following are some guiding principles which may prove helpful in preparing and using a plan of work:

1. It is based on the planned programme and includes the extension methods and other means to achieve the stated objectives.
2. The plan of work should be revised as needed to reflect progress and changes in goals and objectives.
3. It should include necessary procedures to accomplish programme objectives, establish calendars of activity, and designate responsibilities.
4. The total extension job specified in the plan must be practical in terms of staff, time, and other available resources.
5. The annual plan of work should be realistic in terms of possible accomplishments — these to be limited to a few improved practices which can be observed readily by the people and the extension workers.
6. It should incorporate appropriate evaluation procedures to appraise changes in the people reached.

Execution of the Plan of Work (Step 6)

Programme action is the heart of the extension education process. It is here that people learn improved skills, gain knowledge, and are led to change their attitudes.

The first requirement for successful programme action is sound technical knowledge on the part of the extension worker. The second is the use of extension teaching methods suited to the subject matter and to the people involved. For example, the result demonstrated is effective in showing farmers how they may use fertilizer to increase yields.

The value of advance planning of each programme activity cannot be overestimated. This includes making sure that all involved know their responsibilities and how to carry them out — advance preparation of teaching aids, checking on supplies and equipment to assure their availability well in advance of the time they are needed, and special efforts to make each activity a useful learning experience for all participants.

It is usually easy to find a few individuals in a community who will change their practice under close supervision and guidance of the extension worker. The real test of an extension programme is the extent to which improved practices, skills, and attitudes are adopted by the masses of rural people. Extension education as a broad public service cannot be justified on the basis of its value to 5 or 10% of a country's population.

In an advanced country, there are many channels through which people obtain new knowledge on a mass basis. Vocational schools, newspapers, radio, television, farm journals, commercial advertising, salesmen, fieldmen, and many others contribute. The great challenge to extension educators is to find and develop channels of communications to reach the masses of rural people with a practical educational programme, and to do it within the resources available for this purpose.

Appraisal of Accomplishment (Step 7)

Periodic evaluation in terms of objectives of the programme provides a basis for continuous improvement. Plans for evaluation need to be included in the plan of work. This may involve an accurate and precise description of the situation existing at a given time, a record of changes proposed and accomplished, and the periodic description of the situation as it changes with time. Educational methods may also be evaluated to determine their individual and collective influence in inducing change. The results of such evaluations are useful only as they are used in planning future programmes.

SOME GUIDES TO EFFECTIVE PROGRAMME BUILDING

The following is a partial list of propositions prepared by Paul Leagans (2) that have been tested and have wide application:

1. The central purpose of extension programmes is to promote socially significant learning.
2. Effective education is a result of design — not drift; it results from a plan — not from trial and error.

3. The process of programme building is one of making choices, or of deciding on the kinds of objectives or ends toward which teaching effort in a given situation should be aimed.
4. The function of a programme is to provide a clear guide — a blue-print or a plan — useful to workers in conducting an on-going educational programme. A well developed programme is to the worker what a compass is to the seaman.
5. An adequate programme can be developed only through consideration of all the important elements in the situation through an orderly procedure by which workers can bring these elements into suitable relationship.
6. Extension programme building is a continuous process involving the collection and consideration of new facts and new ideas relevant to the situation in the light of progress and other factors which may periodically change the most significant educational ends to be sought.
7. People representing major economic and social levels must be deeply involved in analysing and arriving at decisions about the problems, needs, and interests in an area.
8. To define a rural problem, one must bring to bear both scientific and folk knowledge.
9. The programme building process is a teaching technique.
10. It is helpful to have general agreement among workers at all levels on:
    - *a.* A basic philosophy about the rule of progress developed
    - *b.* A general policy pertaining to programming
    - *c.* General procedures that give direction by providing ample latitude for local workers to meet their particular situation.
11. The selection of a relatively small number of the most significant needs, as revealed by analysis of the facts about the situation, singled out for major attention, contributes to the effectiveness of programmes.
12. The interpretation of programmes to leaders and the general public so that the functions and aims of the workers are commonly known and understood contributes to effectiveness.

I have placed on display a few county extension programmes and plans of work which indicate the product of programme planning in a few countries. In some instances, programme planning instructions issued by State extension offices are attached. I hope they will illustrate some of the principles I have attempted to describe.

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1. UNITED STATES DEPARTMENT OF AGRICULTURE (1961).—Extension development around the world. Report of Conference.
2. LEAGANS, J. P. (undated).—'Some Principles and Concepts of Extension Program Development.' (Cornell Univ.: Ithaca.)

PAPER 86

STATE EXTENSION PROGRAMME PLANNING IN TASMANIA

By C. A. HOLLAND*

Imagine the situation which could arise if an extension worker found his time fully occupied by attending to correspondence, interviewing office callers, paying visits to farms at owners' requests, and generally maintaining farmer contact by attending stock sales.

Such a man could become appreciated officially by attending promptly to his essential returns and correspondence and ensuring that he did not upset any prominent member of the community. He could become popular among certain members of the farming community because they would receive the personal advantage of his time and knowledge. As a result of such appreciation and popularity it could be possible for such a man to automatically consider that he was doing first-class extension work. However, if he sat down at the end of a given period and asked himself what he had really contributed to his primary objective, the education of the farming community, he may be disappointed in his own answer.

Farmers are often told by extension workers that they would be well advised to mark time occasionally and take stock of the real progress they are making in the management of their holdings. Many farmers find it hard to do this as they become so occupied with immediate needs. There is a grave danger of the extension worker falling into the same trap unless he has some planned programme to which he can work. Let us hope that no one ever reaches the extreme of complete dissipation of his energy, but we must face the fact that many extension workers find themselves partially in this position today. We should therefore be sure that we are not side-tracked from our primary function.

Let us look at what happened in Tasmania when the extension service was established 35 years ago. A few officers who had come from several Australian States and New Zealand were stationed throughout the State with the object of lifting its agricultural production. They were not welcomed by the farming community in general and, after making contact at meetings of members of the Agricultural Bureau (which was organized at the same time), were pleased to receive invitations to inspect problems on individual farms. The main requests received related to the identification of weeds and pasture plants and investigation of mysterious failures of insignificantly small areas of various crops. These were real problems to the farmers concerned. The extension officers found it desirable to help solve them in order to gain the confidence of the farmer. This was an essential prerequisite to the introduction of a planned programme which was designed to lead to the solution of the major problem. The problem at that time was unrecognized by the majority of the farming community.

An examination of the position which existed at the time showed that large areas had been cropped out with potatoes and oaten hay for chaff, resulting in depressed yields. The real need was diagnosed as the 'improvement of soil fertility'. The first objective to meet this need was to change the farming system from 'cash cropping' to 'grassland farming'. Then came the programme planning, which embraced introducing types of pastures suitable for certain areas, the utilization of superphosphate, and the introduction of suitable types of livestock. The programme was then implemented by the use of all known extension methods. This was extension programme planning, which was carried out following a complete appreciation of the situation.

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* Tasmanian Department of Agriculture.

The need for determining the main objective before commencing the planning cannot be too strongly emphasized. There is only one thing worse than drifting along without a plan and that is the making of a plan prior to giving full consideration to the need for and objective of such a plan. This happens often in life. Some people make what they call a 'plan' which is often a hasty decision to do something. They subsequently spend a large portion of their time in endeavouring to justify their 'plan', which, in reality, was unfounded at the outset.

To get a picture of the need for maintaining focus on an objective laid down in a plan, let us look back to the first few contacts that were made. Tasmania owes a lot today to those few farmers who were prepared to ignore ridicule which came from their relatives and friends for daring to invite the young 'book worms' onto their properties. These extension officers were all young, energetic, qualified, and practical men, but it was only the realization of the practicability of finally implementing their planned programme which kept them from being side-tracked. How easy it would have been for them to have remained with their first few friends, rather than to seek the masses with whom they knew they were not popular. Actually it was the realization of their fundamental task, the education of the farming community, that enabled them to progress with their planned programme.

Education is a slow process, but must never be substituted by spoon-feeding. Education changes people's attitudes, resulting in their willingness to cooperate and subsequently act on their own initiative.

The implementation of the major programme for the improvement of soil fertility in Tasmania was only made possible by the planning of subsidiary programmes. The most obvious was a drive for the extended use of superphosphate. This was an extension worker's paradise in a country with a large area of phosphate-deficient soil, most of which had never received a bag of superphosphate. Nevertheless, a programme had to be planned and implemented by the aid of all known extension techniques.

Then followed the introduction of improved pastures. There was no Agronomy Division at that time to carry out trial work and make specific recommendations for various soil types and climatic conditions. A start was made on the introduction of temporary pastures and subterranean clover. The programme included the introduction of red clover by underseeding grain crops which were so much to the fore.

There were interesting experiments in this connection which bring out the point of how far we can go to comply with farmers' requests and at the same time progress with a planned programme. The production in one of the districts was largely confined to wheat-growing with continuous cropping; yields were low and Californian thistles plentiful. The farmers, through their local branch of the Bureau, approached the extension officer with their problem, which was low yields, and asked the Department to find a new wheat which would give a higher yield than the few varieties which were being grown at the time. The officer arranged for new varieties to be obtained from the mainland and planted them in rows for comparative purposes, knowing full well that he was not in a position to give concrete advice on significant differences at the conclusion. However, the farmers were satisfied and they made regular visits to the plots and carefully watched the progress of the various varieties until they matured. Without advising the farmers, the officer underseeded the plots with red clover. The farmers on their routine visits soon spotted this and wanted the 'weed' identified.

That was the start. A drive through that district today will not reveal wheat crops or Californian thistles, but pastures carrying 3 or more breeding ewes to the acre.

Another experience with wheat-growers was a request received by a local officer to conduct a wheat-growing competition. This was not included in the planned programme, but was agreed to, much to the delight of the wheat-growers. They all put their best foot forward and produced between 30 and 40 bushels to the acre. However, the opportunity was taken of inviting a few sheep farmers to plough up some of their holding paddocks and plant wheat, with the result that the competition was won by a sheep farmer who produced 82 bushels to the acre. So the planned programme progressed, accelerated by a large-scale demonstration which was widely advertised.

EVALUATION

Over thirty years have passed since State programme planning commenced. The objective of the main plan was changing from 'cash cropping' to 'grassland farming'.

Progress figures covering the whole period were not recorded in the early days, but the figures in Table 1 are believed to be reasonably accurate. It is not claimed that the whole of this change was brought about by the Extension Service, as many contributing aids were evolved in the meantime. Nevertheless, it would be difficult to deny that, had there not been an original planned programme, it is doubtful whether improved pastures would have taken the place of cash crops to the extent they have.

TABLE 1

	Area of sown grasses and clovers Acres	Fertilizers used on pastures Tons
1927/28	?	250
1929/30	300,000	6,000
*1950/51	864,400	32,150
*1959/60	1,335,800	81,950
*1960/61	1,386,000	85,080

* From Commonwealth Bureau of Census and Statistics, Tasmanian Office.

THE FUTURE

We still have many farmers whose individual problems are not necessarily their basic problems.

We still have many improved methods which are not universally practised. Each country and State has its own problems relating to the dissemination of available information. The need for extension programme planning is probably greater than ever before, especially in view of recent downward trends in commodity prices. As time goes on, its implementation can become increasingly difficult on a field level, unless we are on our guard.

It is easy to make sweeping statements such as 'the farm adviser must keep his eyes on the target and his feet on the ground'. We know that he must 'plan his work', then 'work his plan'. It is not always within his control to do so, and the responsibility for carrying out the primary duty entrusted to extension workers must be accepted at all levels, from direction to implementation.

Extension work without programme planning is like flying without a compass.

PAPER 89

THE 'DEVELOPMENT' PHASE OF AN EXTENSION PROGRAMME

By K. M. SILLCOCK and K. E. FLYNN*

The complaint is often made that farmers are not adopting the findings of research. The inference usually drawn is that the extension services are failing to convey the findings to the farmers, or are not doing so in a convincing enough manner. The truth is that a great many of the findings of research, as published in scientific journals, are not fit material to be imparted to farmers. They have not been tested out on a full-farm scale; nor have the difficulties of adapting them to a commercial farm, from which the owner must earn a reward for his labour and a return on his invested capital, been explored, much less explained. Since development of a finding to this stage is not usually carried out by research workers and inventors, it becomes a task of those engaged in extension. This throws new light on the commonly made, but by no means clear-cut, distinction between research and extension; for development is a type of research or investigation at the applied level.

The Cyclic Process of Agricultural Science

The services rendered by agricultural science to farming should follow a cyclic sequence, in which the merging but distinguishable phases are:

Recognition and definition of a farming problem

Investigation of possible solutions, including the activity usually described as research

Development of the solution to the point at which it can be used satisfactorily by farmers

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* Victorian Department of Agriculture.

Advisory work, including publication of the new knowledge and demonstration of its application on the farm

There can be other phases in the cycle, such as assistance to farmers in setting up their own organization, taking of regulatory action, or, in some instances, advice to farmers not to adopt a new practice or appliance too enthusiastically. Development may have to be halted while further fundamental investigation is made; for one cycle, followed to full or partial completion, will sometimes set another in motion by introducing a new problem. Assessment of the result, in terms of the numbers of farmers who adopt a fully developed practice, is sometimes another distinct phase undertaken by the extension workers or by some other group on their behalf.

Some Instances of Development

In some cycles followed in Victoria in recent years the development phase has been prominent.

When responses to molybdenum dressings on certain land were made a press sensation, farmers began to apply it indiscriminately. The Department of Agriculture, therefore, laid down plots on already productive land to show that this and other trace elements were not needed there. Some plots showed, however, that potash fertilizers gave a response on some land not formerly suspected to be deficient in that element. Where a whole farm was potash-deficient, the first impulse was to recommend that the farmer should treat as large an area as possible. But field advisers, finding that potash applications led to a phase of clover dominance which sometimes induced severe bloat in dairy herds, realized that it was more practical to treat only part of the farm with potash at a time, leaving some safe paddocks.

The bloat control problem itself was the subject of development. Two Victorian farmers succeeded in using tallow, instead of the dearer peanut oil, in an emulsion for the treatment of pastures. Private firms, by laboratory research, then produced more stable anti-bloat emulsions based on tallow. These were readily mixed in small batches, but the method then had to be modified to make it possible for farmers to mix the larger batches they needed. A further step was the adaptation of an electric immersion heater for melting tallow in order to eliminate the inconvenience and fire hazard of melting it over the stove in the farm kitchen.

There are other recent instances of development. When the buckrake and the forage harvester became available, the most suitable methods of using them were developed only after much observation of their actual working on farms. A study of spray-irrigation plants on farms was made in order to ascertain how large an area a farmer could irrigate by spray, and what type and size of plant was suitable. Prior to this, many unsuitable plants were sold to farmers.

Implications for the Extension Worker

It is the extension worker's function to recognize and define farming problems and to pursue further those of the greatest importance or urgency. He must then suggest the investigations which should be made by research workers and others, or carry out a local investigation if this is needed. Later, he must develop for farmer use the remedies suggested by investigation, and make the fully developed practice known to the farmers by demonstration, publication, and the other methods. He must also watch for further problems, not at first evident, arising from the changed farming practices. The development phase would forestall the emergence of some such problems, but it does not always make long-term effects sufficiently evident.

Virtues and Shortcomings of Development Work

A new graduate, not yet equipped to enter a district as an adviser, can well enter it to investigate a newly defined problem and, with guidance as needed, to carry out the development work arising from it. This gives him entry to farms without the obligation for him to justify himself as an expert in many fields. New graduates who have been given this introduction to their careers have quickly become authorities, in their own right, on the subject which they have developed. Having published authoritative articles and held demonstrations of their new knowledge, they have been much sought after by farmers.

A young extension worker should not be forced, however, to continue as a specialist in such a narrow field, but should take up a new line of work as soon as possible. This means that he should be relieved of much of the detailed work arising from his first specialty. Wide publication of his work, preferably as short articles in a series in an industry digest, preparation of circulars to save much letter writing, and clerical assistance to relieve him from repetitious correspondence are necessary aids. A further need is the opportunity, at an in-service conference or a specially convened group of advisers, for him to pass on his knowledge to fellow-workers so that they can play their part in conveying it to farmers. For instance, the dairy husbandry officers in Victoria who have made special studies have passed on much that they have learned to Dairy Supervisors at specially arranged meetings.

What are the Country Adviser's Duties?

Investigation and development work are essential for the country adviser if he is to maintain a stock of ideas worthy to be extended to farmers. But as his greatest practical difficulty is to maintain some balance between his various functions, it is suggested that he should carry out each of these activities for some part of his working year:

Investigation and development of some local problem

Whole-farm treatment of some farms, including help to the farmer in budgeting

Farmer group activities and field days or demonstrations

Publication of articles and use of other mass media, not only to spread his information and make himself better known, but also as a continuing exercise in accurate thinking

General and 'recipe' advice as demanded

Reading of relevant scientific literature

Some line of study other than agriculture is also an advantage, making for better thinking

This is a formidable list, but the worker who completely gives up any one side of these activities will lose some of his effectiveness.

Implications for the Senior Officer

The senior officer in charge of an extension team must be alive to the need for this whole range of activity, and should see that his workers are enabled to diversify their work. Many investigation and development projects can be joint efforts of several district officers, but this means that they should be brought together for personal discussions from time to time.

The senior must maintain facilities for publication of information and for supplying the needs of field officers, and he must, when preparing estimates, budget the available finances so that they will enable the branch as a whole to accomplish as much as possible. This means that he must himself have adequate central staff and facilities, so that he is not so loaded down with semi-skilled routine duties that he will fail to give his men constructive and imaginative leadership.

SUMMARY

Many research findings, as published, are not readily applicable on commercial farms. They must be further 'developed' for full-scale use. Development is one essential step in a cycle which begins with recognition of a problem and leads ultimately to adoption by farmers of a suitable solution conveyed to them by advisers. Instances of development are given, and its place in the work of an advisory service and in the training of new advisers is discussed.

SECTION VI

Group Methods and Demonstrations

LIST OF PAPERS

PAPER NO.

93. Group Discussion in Formal Groups as an Aid to Extension Work. *By* P. C. Angove.
94. Farm Group Meetings in Agricultural Extension. *By* F. W. Cutting.
95. Some Group Methods as Practised in Tasmania. *By* B. C. Jefferies and R. P. Tyson.
96. Group Extension in the North Coast Agricultural Region With Particular Reference to the Agricultural Bureau Movement. *By* S. R. Ballard.
97. Discussion and Working with Groups of Farmers. *By* K. M. Sillcock, C. J. Bradbury, J. C. Avery, and J. E. Green.
98. Some Practical Problems Associated with Group Extension Activities. *By* J. L. Groom.
99. Conservation in the Eppalock Catchment. *By* R. G. Downes.
100. Farmer Participation in Group Methods. *By* H. R. Dickinson.
101. The Group Approach to Soil Conservation as an Extension Medium. *By* H. S. Pink and M. H. Roberts.
102. The Development of a Cooperative Soil Conservation Project at Linthorpe. *By* A. F. Skinner.
103. The Agricultural Bureau of New South Wales in Group Extension. *By* J. J. Slater.
104. One-Night-A-Week Courses for Farmers. *By* J. N. Potter.
105. To Achieve the Potential of Short-term Schools. *By* A. D. Mears.
106. Experiences in Planning Regional Farmers' Schools. *By* R. C. Madsen.
107. Small Informal Field Days. *By* R. J. Flynn.
108. Two Field Days — A Case Study. *By* J. H. Ballard.
109. An Experience in Cooperator Selection for Pasture Species Extension in the Coolamon Shire — 1953–56. *By* R. I. Johnson.
110. The Assessment and Solution of an Extension Need Occasioned by a Serious Animal Disease Problem. *By* D. G. Christie.
111. Extension Through Demonstrations. *By* F. A. Vernon.
112. A Dairy Farm Improvement Group Demonstration. *By* H. P. Edgoose.

112*a*. The Dairy Farm Demonstration As a Group Method. *By* P. McCallum.

113. The Community-owned Research and Demonstration Farm as an Extension Medium. *By* F. J. Barkla and K. R. Garland.
114. Extension Aspects of the Milking Machine Survey in New South Wales. *By* B. O. E. Calder.
115. Direct Extension from a Research Project — Serrated Tussock Case History. *By* M. H. Campbell.

REVIEW

By P. C. ANGOVE*

Papers in this section fall into three distinct groups. The first, on group methods, contains 11 papers, and the overriding comment must be on the differences between the various writers' concepts of, and approaches to, this subject. The second group comprises three papers on schools and the third, containing the other 10 papers, is on demonstrations.

GROUP METHODS

I feel that the pattern is well set in the opening of paper 97, by Sillcock, Bradbury, Avery, and Green:

> Advising farmers is very different from teaching an army squad to become proficient in the highly standardized method of using and servicing a particular gun. Each farm is different and each farmer is different . . . Discussion gives the farmer a chance to relate the information to his own farm and it also brings out a collective wisdom which is superior to that of any one participant.

Here we have the whole crux of discussion group teaching and eventual adoption of a new practice.

All groups that secure action follow, either consciously or unconsciously, the same basic pattern:

1. identify the problem
2. collect the facts
3. sort the facts to fit their situation
4. come to a decision in their own time

Several other papers elaborate this principle or present it with a different slant. Cutting (paper 94) sets out to determine the 'needs' of an audience before he starts and this is basic. But extension officers must never forget that they have a clear commission to teach agriculture, and thus they must keep their methods objective. We need to avoid the extension worker who is 'captured' by his audience.

Of the papers about soil conservation, the most interesting to me is that by Pink and Roberts (101). It discusses a group conservation scheme in a particular area of Queensland. This is group work in an ideal situation. All members were sharing a common problem and learning how to overcome it. The result, of course, led to enthusiasm breeding enthusiasm.

Several authors refer to the use of moving pictures in groups. This is good, provided the films are objectively aimed at the subject under discussion. We all know how difficult it is to get such a film, but if it is not objective, and on the subject, it is best left at home. The use of a film for general information at a special meeting called for that purpose is, of course, quite a different matter.

Being a South Australian, I am naturally interested in the Agricultural Bureaux. Only we and New South Wales have Bureaux and Slater's statement (paper 103) that Departmental officers use the Bureau as a platform for their stories is only too true. But I am sure we both try to discover the needs of the Bureau branch before we start; we in South Australia will not send any speaker to any Bureau branch until that branch nominates a subject. In other words, we try to get the Bureau people to do a little objective thinking before they make a request.

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* South Australian Department of Agriculture.

I feel that the establishment of agricultural bureaux throughout Australia could be one of the major contributions of this conference. If non-political and non-pressure groups of farmers were organized throughout the countryside, Departments would have at all times a ready-made platform from which officers could extend the latest developments in agriculture. In addition, this platform could be used to meet any emergency.

My own paper (93) tells of a survey of some 100 farmers who do come to local meetings. It showed that 52% found out about it from a circular sent to their Bureau branch, 35% from the rural press, but only 8% and 4% respectively from radio and a poster. The interesting point is, 'why did they come?' The survey showed that 69% came because the programme offered something of immediate benefit to their farming practice, 26% came because they always came, and only 5% came because some notable speaker was billed to appear. In any agricultural campaign or agricultural programme, this is a platform which Departments cannot afford to overlook.

I feel that farmers come together for two main purposes, from an extension viewpoint:

1. for social contact
2. to learn of the latest developments in agriculture

Any departure from this principle, to my mind, destroys the group concept of extension work.

Jefferies and Tyson (paper 95) have described quite well the various means that can be used by groups. It does not matter whether the means is a 'get together', a 'drive about', a field day, or a school. Provided ample provision is made for discussion — and discussion-leading is a technique all of its own — the result will be the same.

Ballard (paper 96) agrees with the conclusion of the 1953 Extension Conference, that 'adoption follows local acceptance by the group'. This surely is the goal we all seek.

It would be remiss if at this stage I did not refer to farm visiting. Nobody will quarrel with the axiom that farm visiting is the most effective extension method of all. Of course it is. But the numbers of extension officers that Governments are prepared to find make it impossible to visit every farmer, and either we adopt other extension methods or many farmers will be left with no advice at all.

Extension is an integration of many methods. Group work is an extremely valuable extension method, but it is no more the only one than is farm visiting, or the press, or radio. It is, however, a method that will save countless cash in extending a story and it is one of the very few proved methods of securing acceptance.

SCHOOLS

The three New South Wales papers by Potter (104), Mears (105), and Madsen (106) describe quite well the types of schools extension officers normally undertake.

There is variation in programme and variation in method adopted. Madsen describes how farmers themselves sponsor and suggest the programme. Potter tells how he provides the programme, although the topic is suggested by farmers. Each method has its advantages, and the only danger I would highlight would be that the farmer-suggested programme can become too broad. A school is designed to teach more than can be learned from a single lecture or demonstration. Unless, then, a single subject is followed at least a reasonable distance, the thought of a school is lost. Subject matter is important and care should be taken to avoid audience distraction with an array of different speakers.

There is much debate on the comparative value of a three- or five-day school and a one-night-a-week course for two to three months. Each has it advantages. Specific skills are best learned in consecutive days, but the more basic subjects are probably best handled on a one-night-a-week basis.

Residential schools, centrally located, have considerable advantages. On the other hand, the soil, climate, and agricultural practices in a central location may be very different from those in the students' own environments. Success may be greater with a large number of smaller, decentralized schools.

There is no doubt that schools are an effective extension method, and I feel that these three papers form a very worthwhile contribution to this conference.

DEMONSTRATIONS

I would like to say at the outset that I feel this to be an excellent set of papers about demonstrations. Most of the authors have used the demonstration as an aid to either teaching or securing an audience. Some of the authors — particularly Johnson (paper 109), McCallum (112a), and Campbell (115) — used their demonstrations partly for the 'operational' research of which we talked yesterday, and I am strongly in favour of this.

The paper that I really miss is one describing the completely inanimate demonstration or exhibit. The little set of plots by the roadside, suitably labelled, can tell an effective story to anyone who has time to stop and look. Then, too, I regret the absence of a paper on agricultural show exhibits, which are surely demonstrations.

I am very concerned that demonstrations should have an objective purpose directed towards their teaching value, for extension officers must of necessity be 'teachers'. Some of these papers do not appear to have this objectivity, and I ask myself the automatic question, 'what is the writer's objective?' The answer varies from paper to paper. Some authors have clearly set out, as a prime objective, to attract a large audience — 1,000 or more.

One author has justified his demonstration by quoting increases in fertilizer use and in pasture acreage, but similar increases are evident in many districts in Australia. Another describes a farm management demonstration which is really a typical farm club in operation. Yet another describes a milking machine survey where an officer visits individual farmers to test and adjust their machines; this appeals as an excellent service designed to increase efficiency and quite naturally to increase production, but it can hardly be classified as a demonstration.

As extension officers, it is our job not only to teach new agricultural methods, but to secure adoption of them. The demonstration is one means of doing this. The best way to teach a man to do anything is to get him to do it with the teacher and then do it on his own. This is the 'method demonstration', and none of these papers describes a method demonstration. The only means by which we can demonstrate many techniques is the 'result demonstration', but in either case, we must first have a clear-cut objective.

Campbell (paper 115) has an excellent objective: 'to demonstrate eradication of serrated tussock by sowing improved pastures'. Johnson (109) provides another: 'to demonstrate the sowing of subterranean clover on problem soils'. The objective referred to by some authors of securing large audiences was clearly achieved. But if it is our objective to teach our audiences something, or to get them to do something, then let us confine the numbers to a workable size.

Perhaps Flynn (paper 107) has the ideal answer with his small informal field days, comprising small groups of neighbouring farmers, with ample time for discussion. Intimate discussion, audience involvement, and, above all, the ability of the audience to participate are vital to an effective demonstration.

I am tremendously impressed by the accent that the majority of writers place on the human element. The characteristics of the demonstrator and the involvement of the local community are carefully considered. Johnson (109) describes the various demonstrators he was able to use: they were all different and all moved in different circles in the community, yet each was acceptable within his own group and as such was an influence for good.

Barkla and Garland (paper 113) describe a community-owned demonstration farm. This is a refreshing approach. Cash of course is a problem, but the important point is that the local community is fully involved and has a sense of ownership. The all-too-frequent accusation that 'the Government chooses the best piece of land for a demonstration farm' is impossible here, and I feel that the approach is exciting.

Final assessment of these demonstrations is difficult. Our objective must be farmer adoption, and its measurement is only possible over a period of years. In addition, other extension methods to which farmers have been exposed cloud the issue. Yet demonstrations are good and none of us would give them up. We must accept them as one of our valuable extension methods, but, because of their cost, we must be crystal-clear in our objectives before we undertake them.

PAPER 96

GROUP EXTENSION IN THE NORTH COAST AGRICULTURAL REGION WITH PARTICULAR REFERENCE TO THE AGRICULTURAL BUREAU MOVEMENT

By S. R. BALLARD*

With the emphasis on more economic agricultural and livestock production in the post-war years, farmers, particularly younger farmers, have become more conscious of the need for early application of scientific and proved practices. Although the staff of the New South Wales Department of Agriculture has been increased and further decentralized to meet the rapid increase in the demand for its services, advisory officers can only cope with the growing demand and take advantage of it if the farm people themselves assist. This is especially so in closely settled areas like the north coast of New South Wales.

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* New South Wales Department of Agriculture.

Farmer groups such as the Agricultural Bureau, in organizing field days, conventions, schools, and conferences in association with the Department, have greatly assisted the extension worker by relieving him of much organizing work and allowing him to concentrate more on the technical and scientific aspects of extension. However, farmer groups in extension can do much more than relieve the extension officer of non-technical work; they can be a dynamic force in the extension service.

In 1954 the Agricultural Bureau in the Region was confined to a few isolated districts in the Clarence, Bellinger, and Nambucca sections. There are now many more branches in these districts, and others where there were formerly no active branches. This expansion is due largely to organizational work on the part of extension officers and the publicity officer, and a growing appreciation of the work of the Department of Agriculture. It is an indication of the desire on the part of producers for education in the broader fields of agriculture and livestock production.

The Extension Worker and the Agricultural Bureau

Prior to the recent expansion, extension workers were in doubt about wholeheartedly supporting the Bureau. They contended that farmers were so well represented by producers' organizations such as the Primary Producers' Union, the Australian Primary Producers' Union, and the Banana Growers' Federation that another farmers' organization was unnecessary. However, there is generally some competition between certain of the producers' organizations, particularly in the dairying industry, and it soon became evident that farmers themselves would be interested in an independent, non-political organization, having as its primary objective the dissemination of agricultural knowledge. The Agricultural Bureau is such an organization and also provides opportunities for farmers and their wives to meet together for social, civic, and educational purposes, not necessarily confined to agriculture.

The Agricultural Bureau, as now established, is serving this dual purpose.

Agricultural Bureau branches meet monthly. The programme at each meeting includes a lecture, discussion, film screening, or some other educational item. Each branch also organizes at least one field day each year. North coast extension workers have greatly increased the numbers of farmers they contact by regular attendance at Bureau branch meetings and field days. While attendance at meetings and field days increases the requests to the extension officers for individual farm visits which cannot be satisfied, the regular availability of officers at group functions, and the self-help efforts of the branches, achieve a spread of information that would be physically impossible through individual farm visits.

Extension officers have adopted an active rather than a passive attitude to the Bureau, not limiting their help to addresses and demonstrations. Branches have been encouraged to draw up programmes for monthly meetings and field days, to use group discussion, and to delegate actions to subcommittees. This attitude has developed initiative among branch members, encouraging farmer leadership in the community.

The Positive Role of the Agricultural Bureau

The cooperation of Agricultural Bureau branches is highly valued by extension workers in sponsoring field demonstrations and trials. It is one thing for an extension officer to undertake a demonstration, but unless the farmers in the area concerned cooperate, the educational value is limited. With farmer group cooperation and interest assured in the first place by Agricultural Bureau sponsorship, demonstrations can be undertaken with much more confidence. Similarly, trials assume an extension function if sponsored by Agricultural Bureau branches. In many instances branch members contribute labour and materials to make the trial possible or more effective.

Typical of the mutual benefits gained by farmer and extension officer in this direction are the maize and pasture trials carried out on the north coast mainly through the Bureau. The Department's experiment farms release maize hybrids for trial under open field conditions. The extension officers then arrange to establish trial plots on farms selected by branches. Field days are organized by the branches and the Departmental officers demonstrate the new hybrids. Visual evidence of the superiority of better hybrids, because of either resistance to disease or higher productivity, is available to the farmer right in his own back yard and is supported by discussion of yield figures at local meetings. Persuasion to adopt new hybrids proved in the trials is then much easier and much of the persuasion comes from fellow farmers. Similarly, a demonstration sponsored by a Bureau branch can come to be regarded as the farmers' own project: as such the practices demonstrated are much more likely to be adopted.

Wider initiative develops as Agricultural Bureau branches realize how great a part they can play in cooperation with the extension services. An early step from meetings, field days, and demonstrations for the group was assistance in arranging itineraries for milking machine survey officers. A more recent development is the organization of special-purpose study courses. These courses, for example in animal nutrition, soils and botany, and farm management, have attracted attendances larger than anticipated at the outset: as many as 60 farmers have enrolled for a course held one night each week over a period of five weeks in a comparatively small locality.

Many branches of the Agricultural Bureau have not confined their activities to agricultural education, but have taken the lead in the development of their districts. They have successfully sought extensions of, or improvement in, electricity reticulation, communications, educational facilities, transport, and roads, and some have undertaken bigger projects. The Kyogle branch sought the cooperation of other branches and other farming organizations to have subterranean water resources surveyed, and also took the initiative in a campaign for a water conservation scheme for irrigation and stock purposes in the upper Richmond area. Government interest in both ventures has been aroused. The Kyogle branch also carried out a survey among district farmers to support a request for an artificial stock breeding service through the Milk Board of New South Wales. As a result, the Milk Board established a sub-station in the area. This should lead eventually to better stock and higher production. The Dorrigo branch has followed a similar course, and it appears that these efforts too will be successful in introducing artificial breeding of dairy cattle to another area.

As part of their efforts to speed adoption of improved farm practices and to reduce costs, a few branches have formed buyer cooperatives. The first of these was established by the Backmede–Fairy Hill branch two years ago after a talk by an officer of the Department. Turnover last year was near £4,000. Though purchases have been mainly seed, fertilizer, and farm hardware such as galvanized iron sheets, piping for irrigation, tools, and household requirements, plans are being made for the purchase of farming plant which will be operated as a machinery pool. This development could be of inestimable value to the area and the idea could spread to other small-farm, closely settled districts.

Similar in character is the group buying plan of the Missabotti branch in the Nambucca district, which has negotiated a number of contracts for supply of seed, fertilizer, and various farm requirements at wholesale rates, direct with the wholesalers. Though somewhat loose as a business arrangement, it operates quite satisfactorily.

Conclusion

The increase in the number of people contacted by extension officers has been only one of the advantages resulting from the extended establishment of the Agricultural Bureau on the north coast of New South Wales. Agricultural Bureau branches have been active in many projects designed to increase the spread of information, encourage the adoption of better farming methods, improve production and community conditions, and reduce farm costs. Perhaps an even greater benefit has been the spirit of friendship and cooperation that has developed between extension officers and farm people.

Paper 101

THE GROUP APPROACH TO SOIL CONSERVATION AS AN EXTENSION MEDIUM

By H. S. Pink and M. H. Roberts*

Experience has shown that a drainage scheme, not only for an individual farm, but for the whole of a natural drainage unit or catchment area, is an essential base upon which to build other conservation practices.

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* Queensland Department of Agriculture and Stock, Toowoomba.

Generally such schemes not only require the complete reorganization of the farm layout and management practices, but also the understanding, assistance, and cooperation of each landholder within the catchment area. Farmers must also learn to adapt themselves to many new techniques and skills applicable to the new method of farming. A period of two to three years has usually been necessary for the average farmer to readjust his attitude to this approach. Then, the implementation of the essential drainage scheme takes a period of five years or longer. This generally depends upon the level of understanding the farmer has gained regarding soil conservation principles. Financial aspects are also important.

THE PROBLEM

The problem confronting the soil conservation officer at a Darling Downs centre in Queensland was this: How could the time lag between the acceptance of some need for conservation and the understanding of the principles and practices involved be reduced, at the same time improving the standard and scope of the measures adopted to maintain and increase production?

RELEVANT FACTORS

1. Considerable publicity had been given to soil conservation activities over the years. This was designed to focus the attention of landowners on the problem of erosion and the need for the adoption of control measures. Some good work had been done in isolated areas. However, little progress had been achieved in developing an understanding of the basic principles of conservation by the majority of people in rural communities.
2. The general low level of urbanization in many farming areas contributed to this educational problem. Nevertheless, no organized approach to extension involving community education and participation, and based on an understanding of the problems confronting the producer, had yet been tried.
3. The adoption of such an educational programme seemed desirable if soil conservation schemes, which have such far-reaching effects on farming methods and management and on community development and welfare, are to be successful.
4. There was an unwillingness on the part of many farmers to recognize a need for change. Lack of confidence in their ability to overcome erosion problems was partly responsible. It was often associated with a lack of communication between farmers even within compact neighbourhoods.
5. Lack of readily available finance often contributed to a lack of interest — some were afraid of the expense they may be letting themselves in for.
6. A relatively low level of contact on the farm was maintained by the Department of Agriculture and Stock.
7. Most contacts with farmers were made on a specialized basis, so the tendency was for specialized advice rather than the development of a plan for the improvement of the farm.

ANALYSIS

1. When visited at his office by a farmer whom he considered was a potential organizer, the soil conservation officer explained that there were others in the area who had also expressed a desire to do something about erosion control. He explained to the farmer how much easier it would be for everyone if all farmers would cooperate in a community drainage scheme and discussed with him the idea of getting the farmers together to have a discussion about their problems.
2. The farmer agreed to cooperate and organized a meeting of a 16-farmer neighbourhood. The soil conservation officer was asked to be present. He explained the need for cooperation, and showed how the farmers could help to develop the plan that needed to be prepared.
3. At this and subsequent meetings the farmers were able to learn to understand what was involved in a soil conservation plan.
4. Many of the fears which arose from both real and imaginary difficulties were removed because facilities were provided within the group for overcoming them. The confidence of the more diffident farmers was increased by discussion with neighbours who were solving problems similar to their own.
5. In the soil conservation drainage scheme all farmers found they had some common ground for discussion, and this helped to maintain interest.
6. All members of the group were sharing a common problem and learning how to overcome it. This provided the facility for discussion at other neighbourhood meetings and sporting functions. It also provided common ground for the development of friendship and further discussion when meeting at the major shopping centre in the area.
7. The pros and cons of all aspects of the soil conservation plan were able to be discussed and understood before work was undertaken.
8. In the formation of the group the chairman was democratically elected by the group themselves. It transpired that the group did elect the true informal leader as chairman and this is considered as an important factor in its continued success.

THE OUTCOME

Sixteen farmers in a neighbourhood group with common drainage problems were brought together. They asked for a drainage plan to be prepared for them. They discussed the plan together and finally adopted it for implementation. Research activities have since been attracted to the area to help provide answers to some of the problems brought forward by group members. A greater awareness of problems has developed. A soil conservation film evening in an adjacent area was sponsored jointly by the group and the grain-growers. Group members actively participated at the meeting and their Chairman proudly outlined the activities of the group to date. This served the dual purpose of helping to spread interest in soil conservation and maintained satisfaction with the achievements of the group.

The group has also developed powers of decision-making. They considered the purchase of a power grader to assist with their construction work, but have decided against it for the present.

The planting of kikuyu grass in waterways has always been regarded as a somewhat unpleasant task. Sometimes this results in slow establishment due to skimping the task. The group has decided to approach this cooperatively. Not only have the members purchased a plough for the group, but they have worked together to plant waterways for each other.

A family farm tour around the properties of two of the members was recently organized by the group. This enabled group members, and some farmers outside the area, to see at first hand the progress being made. At afternoon tea the farmers and their wives and children were able to get to know each other better, and this will help to further develop cooperation in the future.

PAPER 105

TO ACHIEVE THE POTENTIAL OF SHORT-TERM SCHOOLS

By A. D. MEARS*

Short-term schools and courses are valued highly in extension. They provide opportunities to teach at greater depth of detail than the normal meetings with rural people; and, since the audience is selected (by the participants' own enrolment actions), they have the side effect of developing leaders in local problem-definition and explanation. Another side effect is that school publicity makes increasing numbers of people aware of the extension service and its activities, and helps to achieve mass awareness of some of extension's objectives.

Schools or courses promoted by local leaders, and held in or near the area where the participants are farming, are more highly valued than 'centralized' schools that draw their attendances from distant and widely dispersed environments.

Schools as an Extension Method

The schools are essentially a group method of extension, but they also effect extension by other means. Personal contacts between the participant and the teaching personnel are inevitable, and an important ingredient. The frequency and depth of contacts vary inversely with school size. To maintain a high level of personal contact in a school of 3 to 5 days' duration, the optimum would be about 30 participants; and, in the effort to teach as many as possible at each school opportunity, the maximum ought not to exceed 40.

People who attend the schools achieve there closer contact with the extension service. They get to know extension officers and to understand their aims and methods better. Many participants who have not previously been 'involved' in extension get an appreciation and thereafter seek to identify themselves with it.

Enrolment for a school or course indicates interest in the subject matter. In this frame the participants are receptive, and actively evaluate and link new information with previous experience. In many cases the attitude to change advances to at least the trial stage, and in others to adoption, helped by the opportunities at the school for discussions with tutors and fellow participants. Participants extend their information, and may even persuade others to make contact with the extension service. If they are already local leaders, the lateral spread of the effect of the school is greater.

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* New South Wales Department of Agriculture.

Schools in the Extension Plan

Various types of school have been developed. On the one hand are those that are centralized and residential at an institute such as a college or a research station. On the other are those held at a place within or near the area where the participants farm; some are residential and some 'by the day'.

Schools have been held at Hawkesbury and Wagga Agricultural Colleges, during the vacations, for many years. Each school covers a separate industry—dairy school, piggery school, poultry school, agricultural school, vegetable school, etc. though some have been specialist in other ways, as, for example, the machinery and tractor maintenance schools and leadership schools. They continue to attract attendance from throughout the State.

The schools held at Yanco Agricultural Research Station, in the Murrumbidgee Irrigation Area, tend to have had irrigation as a common denominator—whether concerned with sheep industry, cattle industry, pastures and fodder conservation, or fruit industry. Many who attend are, however, from non-irrigated properties. Programmes have been shaped to cater for them also. The distances people travel to this Yanco type of school are shown in Table 1. Diversity of backgrounds and problems of the students at these schools can be inferred. (This is true also of schools at the Agricultural Colleges.)

TABLE 1

DISTANCE TRAVELLED TO YANCO AGRICULTURAL RESEARCH STATION SCHOOLS IN THE TWO YEARS 1960 AND 1961

Range	% Enrollees
0–100 miles	40
100–200 miles	21
200–300 miles	19
300–400 miles	17
Over 400 miles	3

Local schools are initiated and conducted by farm organizations, with some organizational assistance from extension authorities. Among the farm organizations associated with this type of school, the Agricultural Bureau of New South Wales has been particularly active. Local extension officers assist local committees in programme drafting. Restriction of a programme to one broad subject (irrigation, beef cattle, sheep husbandry, for example) is characteristic. Another characteristic is that those attending have similar farms and problems. People do not come from far distant places to these schools, as can be seen from the figures in Table 2. The availability of trained local leaders is important to this type of school. The amount of aid necessary from a central authority has varied with their experience and ability, as well as the type and range of subject matter sought for the school.

TABLE 2

DISTANCE TRAVELLED BY APPLICANTS TO FIVE SCHOOLS SPONSORED BY THE AGRICULTURAL BUREAU IN 1960–61

Range	% Enrollees
0–40 miles	40
41–80 miles	40
Over 80 miles	20

Tutor Availability

There is a need to increase the communicative skills, and the numbers of people available as subject-matter tutors, in order to maintain standards and increase the frequency of schools. Cooperation and interchange of personnel between school-sponsoring bodies is the most likely answer. A training programme to develop the adult-education skills of potentially suitable tutors is necessary. Coordination is needed between school-sponsoring bodies; it does in fact exist, up to a point.

Sources of tutors are the Department of Agriculture, other government departments, the universities, commercial firms, specialist associations, and leading farms. A successful tutor requires enthusiasm for the task and a compound of the skills of the adult educationist. A specialist who is willing to speak but has not the communicative skills may add to the effectiveness of advance publicity, but in due course this proves to have been at a cost of effective teaching. To continue this risks lateral spread of adverse impressions by the participants. Extension officers and potential extension workers of the Department of Agriculture receive some training at in-service methodology training schools conducted by the Department's Division of Information Services. Experience has shown it to be very necessary. There would need to be more of this, in an intensified programme, shared by other institutions, to cope with sufficient training of sufficient numbers of potential tutors to meet the increasing demand for farmer schools and courses.

Knowledge of the backgrounds of enrollees for farmer schools would be a help. Basic educational levels vary greatly, and affect the manner and success of tutorial presentation of material. Choice of tutor could well be affected by advance knowledge of the educational levels of enrollees; but, on the other hand, the level of basic education of an enrollee as measured by number of years of formal education does not always reliably indicate the true educational level. This remains a problem area for school-sponsors. Over-simplification of matter reduces the value of a particular school or course for some who attend. The extent of managerial responsibility and of enterprise complexity varies greatly between the 'students'. This also should affect programme construction and session content. For example, if enrollees indicated (at times of application) relative complexity of farm enterprises, management content of the session material might well be strengthened.

Enrollees' ages range between 16 and 60 years. The ranges of age and experience strengthen the intra-school discussions. On the other hand, the age range may effect too wide a range in rates of perception. Diversity of areas from which enrollees come can affect choice of tutorial personnel. When the enrollees are from widely dispersed areas, teaching personnel with wide experience are needed; if the enrollees are from a close area the local extension officer may be most useful.

Need to Collect Data to Aid Programming

The writer has made preliminary studies of information from applicants in forms completed by them in 1960/61 while seeking enrolment for schools at Hawkesbury Agricultural College and Yanco Agricultural Research Station, and for schools conducted in local areas by Agricultural Bureau units. Wide variations in levels of formal education, ages, managerial responsibilities, and complexity of farm enterprise are apparent. The distances people have been prepared to travel daily for schools held in their part of the State have also been of interest. They indicate that this type of school could be promoted successfully at closer geographical intervals than hitherto thought (with confidence in the availability of sufficient enrollees).

More searching inquiries along these lines are needed, so that programmes to fit more closely the needs of applicants, and to use available resources most effectively, may be devised for each occasion.

Paper 107

SMALL INFORMAL FIELD DAYS

By R. J. Flynn*

Formal group meetings and field days have purpose and value in agricultural extension, but many proposals for change are unlikely to be understood, or accepted, unless they are discussed in a more intimate atmosphere. The individual farm visit provides such an atmosphere; but the author attempted to find an alternative which, while maintaining the necessary intimacy, would increase the number contacted.

The use of neighbour groups at small informal field days provided an answer to his problem in the Nambucca River district.

Methods

If he is to adopt small informal field days as one of his extension methods, an extension officer needs an intimate knowledge of a district's problems and reliable and applicable technical knowledge likely to provide satisfactory and economical solutions.

The author's first experience with this method of extension arose from the request of one or two neighbouring farmers to be present on a property on the Nambucca during discussions with the owner on an arranged visit. The day was successful and was followed by other occasions on which it was suggested to the farmer to be visited that others with the same problem may like to attend. After a relatively short time it became usual for neighbours to be at a farm to which a visit was previously arranged, making the organization of small field days easy. It was not usually found necessary, on the coast, to visit more than one other farm of the group — sometimes amounting to seven — unless some specific problem of application arose. Without the small-group approach separate visits to all would be required to achieve satisfaction. Methods of approach to problems differ from the broad-base statements necessary at formal field days. Explanations of detail and of management and economic problems affecting adoption of new or old advice is possible; economic aspects become most important. It is also possible and necessary to consider the effects on the farm family.

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One use of the method was in helping meet the problems arising from uneconomic cane prices forcing farmers to consider alternative enterprises. The effect of such a change on farm family life is not inconsequential — small-group discussion allowed the effect to be considered and understood.

The farmer is much more ready to contribute to discussion when he is among a small gathering of neighbours than when in a large gathering of strangers and will contribute to the analysis of a problem. The objective in group analysis of a problem is to arrive at a practical application, or, if a practical solution is not possible with the knowledge available, to define the problem in terms that can be resolved by a simple trial. There are cases, of course, where the problem requires research for its solution. Participation in problem analysis makes the farmer feel as much in the picture with the adviser as the 'usual' district cooperator with the more highly capitalized farm and frequent publicity.

Translation of the broad recommendations and the artistic posters used at formal field days into the group vernacular is particularly important in developing confidence in the recommendations. This is most easily done by informal discussion of the application of the recommendation to a local problem.

The whole-farm and family approach to individual problems or to the utilization of problem areas is most likely to achieve acceptance of change. A field discussion in a neighbour group has much of the intimacy needed for the whole-farm and family approach.

RESULTS

Interpretation of extension service recommendations in terms of individual management circumstances and economic considerations at small informal field days on the Nambucca was a valuable follow-up to the larger-scale methods of extension.

'Down to earth' discussion groups give farmers an insight into the mind of the extension worker and allow them to determine whether he is of the 'problem-solving' or 'let-well-alone' mind — a composer or a fiddler — or has tomorrow's approach or yesterday's. As a result the farmer can assess the extension worker and make his decisions accordingly. Self-selection of the group, on either a neighbour-group or a common-problem basis, eliminates the need for time-consuming organization by the extension officer.

Neighbour-group field days provide an appropriate atmosphere for the development of application of economic factors and the development of individual problem-solving skills. The social forces in neighbour groups assist teaching efficiency and promote adoption of new practices. Informal groups do not have the psychological barriers that arise on formal occasions and stifle interest and participation. Rational, deliberative decisions are most easily arrived at.

Conclusions

Adoption of the small informal field days supplements the mass and the other group methods used by the extension service and leaves the farmers concerned with a better realization of the usefulness of extension officers. At the same time, the experience develops the extension officers, improving their ability to cover the gap between the results of research and farm application of these a little more quickly and efficiently.

Analysis with a self-selected and extremely interested group contributing on a personal basis is the most effective means of defining many extension problems. Small informal field days make use of the social strength of the neighbour group with a consequent free and frank exchange of ideas leading to the integration of a proposed new technique with local practice and to the possibility of group commitment to adoption of the technique.

Small informal field days are the extension method that most closely approaches the special advantage of individual farm visits.

Paper 115

DIRECT EXTENSION FROM A RESEARCH PROJECT — SERRATED TUSSOCK CASE HISTORY

By M. H. Campbell*

Serrated tussock (*Nassella trichotoma* (Nees.) Hack.) is a perennial grass weed which infests two million acres of New South Wales. The grass is a weed because grazing animals will not eat it voluntarily, and because of the ease with which it spreads.

Pasture improvement is a proven and accepted means of control on arable and semi-arable land (1). On non-arable land present research work indicates that aerial application of herbicides (2), improved species, and fertilizers could prove successful in controlling tussock. This method has proved successful in New Zealand. However, the cost of this treatment is beyond the individual farmer.

Extension Activities

The Rockley area of New South Wales has been chosen as the example area because research and extension have been carried out extensively in this area over the past eight years.

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* Experiment Farm, New South Wales Department of Agriculture.

Direct Contact with the Farmer

The most valuable contact between the Department of Agriculture and the farmer was obtained when 28 Agricultural Extension Grant demonstrations were placed on individual properties between 1954 and 1960 (1). These demonstrations were areas of pasture improvement of approximately 25 acres, prepared, sown, and managed by the farmer under the supervision of the Department of Agriculture and financed through the Agricultural Extension Grant. Contact was made during the establishment of the demonstrations, and once or twice a year thereafter for four years. During these visits the farmer concerned became thoroughly conversant with means of controlling serrated tussock on arable land. Field days on the demonstrations provided contact between the Department of Agriculture and surrounding farmers.

Talks delivered at meetings, e.g. of the Agriculture Bureau, and the supply of information to interested farmers when they called at Department of Agriculture establishments, resulted in further direct contact.

Rockley falls in the area of the District Agronomist, Bathurst. Due to staff shortages, the position has been vacant for three of the last five years, and thus direct contact with Rockley farmers by a District Agronomist has been restricted. Fallding (1957), in a survey of social factors in serrated tussock control in the Rockley district, found the degree of direct contact between farmers and the Department of Agriculture shown in Table 1. It is apparent from these figures and also from those of Table 2 that direct contact between the farmer and the Department of Agriculture has been limited.

TABLE 1

Type of contact	Number of farmers
Direct contact with the Department by writing, calling, or phoning for publications and other information:	
Never	19
Once or twice in a lifetime	7
Habitually	1
Having a representative of the Department on the property:	
Never	23
Once or twice in a lifetime	4
Frequently	0
Attendance at Departmental field days:	
Never	15
Once or twice	8
As often as possible	4
Knowledge of and participation in the Agricultural Bureau:	
No knowledge of its existence	15
Knowledge, but no membership	9
Membership	3

Indirect Contact with the Farmer

Weeds inspectors employed by Weeds County Councils (local government bodies) have been the most valuable form of indirect contact used by the Department of Agriculture. The Department has conducted special courses to train the inspectors in weed control methods. The advantages of this type of contact are that weeds inspectors visit a great number of properties and have direct contact with the most needy cases.

Other extension media used in this field include radio, press, and special literature.

In his survey, Fallding (3) found that the main sources from which farmers learned of the existence and treatment of serrated tussock were as shown in Table 2. Many of these sources overlap and can be traced back to the extension activities of the Department. From Table 2 it can be seen that extension by the Department through indirect sources is more widespread than through direct contact. Fallding gained the impression that farmers thought of the Department of Agriculture as a benefactor to the man on the land, but one that operates at a remote distance from them and through many indirect channels.

TABLE 2

Source	Number of farmers
Own observations	58
Weeds inspectors	53
Neighbours	45
Newspaper and radio	29
Literature of the Department of Agriculture	11
Direct contact with officers of the Department	8

THE EXTENSION PROBLEM

In his survey Fallding found that 26 out of the 27 farmers interviewed in the Rockley area knew the accepted means of tussock control on arable land, and every one of these farmers was giving tussock control first priority. Despite this widespread knowledge, and the fact that at least 50% of the infested land in the Rockley district is arable, the weed is still spreading rapidly. Thus, the majority of landowners know how to control serrated tussock on arable land, due to the efforts of various extension services, but are not effectively putting this knowledge into practice.

Fallding considered that this position could be explained not so much by farmers' ignorance or apathy, but by their sheer inability to control the weed. His meaning of 'sheer inability' is that a landholder has so much tussock that his resources are inadequate to deal with the weed. These cases are in the minority: Fallding found only 6 out of 27 farmers interviewed in the Rockley district who considered their position to be such. The more important meaning of 'sheer inability' lies in the farmers' lack of agricultural skill, systematic farm planning, and business acumen.

Experience gained from cases where Agricultural Extension Grant demonstrations were placed on individual properties has shown that most farmers endeavour to follow the lead given by the demonstrations, but do so in an unsystematic fashion, with little attention to detail. These farmers make poor headway against the weed, their efforts usually resulting in the endless rotation of tussock–pasture–tussock. In contrast to these cases, there are many examples of able and thorough farmers who have put into practice the information demonstrated by the Department, and as a result have properties free of tussock although situated right in the centre of heavily infested areas.

Thus extension of knowledge on tussock control has reached the farmer in the Rockley district, and those farmers with ability have eradicated, or are in the process of eradicating, the weed. The less able farmers need help. Help over and above that which has already been proffered. This help could most effectively be supplied in the form of more direct and intensive extension measures; i.e. the formulation, by a farm management expert, of a plan for the eradication of serrated tussock on individual properties. Planning and supervising in this manner would help considerably in overcoming the 'inability' of the less able farmers and placing them on a successful path to tussock-free properties.

The extension methods employed up to date in the fight against tussock have achieved only moderate success. Far more attention must be given to the problem of the individual farm unit.

Initiating a Programme

The first step would be to provide the farm management officer with the latest knowledge in the control of tussock. This could be effected by conducting him on an inspection of demonstration and research work in the Rockley district. During his introductory period he could meet and become accepted by the local farming community.

The arguments presented have been based on the control of serrated tussock on arable land. Control will be more difficult on semi-arable land and even more difficult on non-arable land.

Finance

Lack of finance is an integral part of some farmers' 'inability' as Fallding has pointed out. This is a problem which in the worst cases requires special attention, but in the majority of cases can be overcome by sensible utilization of special funds already available from the Rural Bank of New South Wales.

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SECTION VII

Mass Media

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135. The Use and Misuse of Visual Aids in Agricultural Extension. *By* S. H. Saxby.

REVIEW

By C. Webb*

This review is based on the statement by Professor Hadley Read, University of Illinois, U.S.A., 'The effective use of mass media by extension workers is essential for sound influential extension education programmes'.

I believe that all delegates to this conference are convinced of the value of the mass media in extension work, although there is a tendency in some quarters to take the mass media for granted, or to regard them as being somewhat out of date or 'small time' with the development of the more sophisticated approaches to extension work. However, while I am fully aware of the value of all facets of extension work, the basic value of the mass media is unchallenged. For instance in the Bairnsdale study by Emery, Oeser, and Tully, published under the title 'Information, Decision and Action', exposure to the media was shown to be a key contributor to the adoption process.

In the presentation of papers such as those before the conference, it is very important to use the same precision as is devoted to the planning and carrying-out of fundamental research work. Several papers in this series show evidence of fuzzy writing and poorly based conclusions. However, although I regret that several leading authorities on the mass media in Australia have not contributed written papers to this conference, the papers which are before us highlight several important facts.

Extension workers throughout Australia, particularly those who work with the mass media, have a real concern for the effectiveness of their work. Mr. Engel's paper, 117, illustrates this well.

Each medium has a specific, rather than a general, place in the extension programme. Mr. G. A. Crawford's paper 120 gives the classic example of experience in the Murrumbidgee Irrigation Area, where it was found that, while radio was not successful in producing adoption of new methods by itself, it had an important part to play. In paper 129, Mr. Jamieson writes 'Radio is naturally thought of as another extension tool, and not a teaching process complete in itself'.

The effectiveness of the mass media depends greatly on the purposefulness with which they are used. I think that every item prepared for the mass media should be prefaced with a statement of its purpose.

While the mass media can be somewhat competitive they are strongly complementary. In paper 127, Mr. Johnson describes the use of two local radio stations and one newspaper in a spray-warning programme. My policy is to give, where possible, advice on local problems by local advisers or Statewide experts, and to use all the media I can, where I can, as often as I can. I have little time for any suggestion that television will replace the need for radio or any other mass medium to any large degree.

Human relationships are vital to the practice of the mass media. Mr. Swann (119) draws attention to the public relations value of the mass media. In paper

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122, Mr. Lawson claims that many agricultural scientists disrespect the Press, and, in 134, Mr. Madsen describes the lack of cooperation which some country agricultural societies offer in connection with exhibits of extension value. I stress the value of maintaining the right relationships between every person and institution associated with agricultural extension work.

Personality can be expressed strongly through all of the mass media. In paper 125, Mr. Godden claims that a radio worker must have a keen interest in radio potential, and that a reflection of his personality is more important than voice production in gaining the interest of rural people. I draw attention to the value of the by-line in stimulating the morale of the writer; in getting him known to his public; in adding authority to his work; and placing on him the responsibility for what is presented in his name.

Television is providing us with a new and very powerful tool which will demand some reorganization of our work. In paper 132, Mr. John Noble has set out well the Australian Broadcasting Commission's television programmes and, in 133, Mr. John Brien and I have given serious consideration to the impact of this medium on agricultural extension work in Australia — giving special attention to country-based programmes.

Non-Governmental agencies are playing a valuable part in Australia's agricultural extension programme. In paper 123, Mr. Hal. Bannister describes several ways in which his newspaper is contributing to the Commonwealth's extension programme and, in 29, Mr. Frank Pearson tells how Mr. Bannister's newspaper was called in by the South Australian Department of Agriculture in the early stages of a campaign to improve barley-harvesting methods.

There is still a great need for training in the mass media. As this matter will be discussed in detail at a later session of this Conference, I will not deal with it fully now, but can refer you to Mr. Hal. Bannister's paper 123, and Mr. Bill Ritchie's paper 156 for good references on this subject.

There is probably even a greater need for assessment and research work.

I will now deal briefly with each of the main media.

Publications

It is important to maintain good relationships with editors. In paper 121, Mr. Hall states very simply that it is wise to keep close contact with an editor (a) to see what he wants and (b) to show him what we have to offer. In paper 4, the South Australian Department of Agriculture writes 'the secret seems to be to learn what editors require, and produce it'.

Human-interest and success stories can contribute well to an extension programme.

The oft-discredited local paper is an excellent medium.

I commend suggestions that regular space, such as a weekly column, be used with newspapers, and deplore any reaction that it is unwise to accept any offer of such space because such a commitment might become difficult to maintain.

I agree with Mr. Lawson's reference (122) to the prestige value of the metropolitan press and direct your attention to Mr. Godden's (125) use of a 'questions and answers' column.

I direct your special attention to the Victorian Department of Agriculture's special industry publications (Digests), and also to the authors' claims that these publications have placed desirable added responsibility on them as extension workers and have actually increased, rather than reduced, the number of requests for farm visits.

Radio

I cannot agree with the somewhat timorous suggestions that, with the advent of television, the need for radio will diminish considerably. Admittedly, radio audiences will fall and different patterns will be worked out, but radio will always retain its value of immediacy; for a long time, it will have the advantage of longer hours and cheaper transmission; at least for the present, the important breakfast and lunchtime radio sessions have no competition from television; and radio is the more flexible medium, especially with the more common use of transistor sets which reduce family pressures for alternative programmes when farm information is on the air. I refer you to the Victorian Department of Agriculture's techniques in radio which Mr. John Brien and I have set out in paper 130, and also to Mr. John Douglas's statement (128), 'Radio in extension work is fast becoming the most popular modern tool in many countries of the world'.

Television

We are indebted to the Australian Broadcasting Commission for its television work since 1956, described by John Noble (132), in presenting agriculture to a primarily urban audience, to a limited rural audience, and to a wider rural audience, in addition to the Commission's cooperation with other formal extension agencies and its development of helpful techniques. I believe that audience is still a vital factor and that, even in country areas, it retains a high urban percentage. I draw attention to the public relations value of television, and, from eight months' active experience with the Victorian Department of Agriculture's special weekly 'live' sessions, am convinced of this medium's power and potential.

Visual Aids

Messrs. Madsen (134) and Saxby (135) have drawn our attention to the place of visual aids in the extension programme. Please note the development of special standards for aids in New Zealand (135), and the claim (5; 135), with which I agree, that the film can be used best as a focal point of discussion.

SPECIAL POINTS OF THOUGHT

If I had to choose only one point for discussion, I would name the need to keep our lines of communication in good order. There are many gaps in these important channels, and I sincerely trust that our relationships can be kept smooth, orderly, and continuous. We need to develop a greater news sense in our work, and I commend the internal newsletter for keeping all personnel advised of developments in an organization or profession.

There is little evidence in the papers which have been presented to this conference of a definite objective for our work. I appeal for broad goals and objectives to be set.

Programme planning and the allocation of priorities can increase the effectiveness of our work greatly. We must guard strongly against any piecemeal, routine, 'organ-grinder' approach to our work.

I believe that television — the potential 'Frankenstein' — can be domesticated and used to great advantage.

I suggest that we should continually review our work programmes. There is need for a dynamic approach to the mass media, and also for more training in the associated skills and disciplines. I draw your attention to a quotation from Mr. Saxby's paper 135. 'Whether we like it or not, we must realize that the producers of comic strips in the newspaper and magazines attract large numbers of people because of the eye-catching short-captioned illustrations. The extension worker may well be forced, by public demand, into presenting some of his material in this manner.'

Special attention is needed to our 'score' of efficiency in terms of inputs and outputs. Such consideration is vital at a time when a powerful, and expensive, medium such as television becomes available to us.

Finally, I offer to you two special lines of thought for what I believe could be profitable discussion:

1. Let us look at mass media from the point of view of the extension specialist. How can mass media help him in terms of source, channels, and audience?
2. Let us, as mass media specialists, develop an awareness and definition of our problems.
    - What is our status in the extension setup?
    - How can we obtain better training for greater efficiency?
    - What is the best staffing for utmost effectiveness?
    - How can we develop assessment for a yardstick?
    - In what ways can we use research in extension work to increase our precision?

THE EFFECTIVE ROLE OF MASS MEDIA IN AGRICULTURAL EXTENSION EDUCATION

By HADLEY READ*

First, let me say that it is a great privilege and a stimulating experience to participate in this extension conference. You have identified opportunities and outlined problems so similar to ours in the States that I wonder if I've left home. It is comforting to know that we do not have a monopoly on problems, and I can assure you that neither do we have a monopoly on answers to problems.

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Although I have studied all of the working papers for the conference with keen interest, I have been particularly impressed with the attention you have given to the use of mass media in extension work. While these excellent papers also make me feel at home, they suggest that it will be difficult for me to contribute anything significantly new or profound to your deliberations. Instead of attempting to be profound — which I can't be — I would like to spend these few minutes this evening in a review of the role of mass media in extension work, with some thoughts on how we may be able to improve the effectiveness of this role. Before attempting such a review, however, we should consider the role of extension itself, because mass media methods are but one set of tools we use in extension work.

While it is not the purpose of this paper to explore the philosophies of extension organization and operation, it does seem important to me that we accept the premise that extension is a great deal more than the mere dissemination of information. To me, extension comprises an informal system of education. Our general purpose is to increase the level of knowledge and understanding of our audiences. Our direct purpose is to change the behaviour of the people in these audiences. All of us in extension, therefore, are involved in an educational process just as much as the teachers in our elementary schools and the professors in our colleges and universities. The main difference is in our organization and methods.

If we accept the premise that extension workers must be specialist in education, we must also accept the premise that we should be specialists in the process of communication. The carrying out of extension education involves the continuous application of the communications process. This basic process is in operation when you and I sit down to talk about the problems of extension as we are doing at this conference. It applies when we work with local people in determining local problems. And we certainly are involved in the communications process when we provide information to help people solve their problems.

I would like to consider the role of mass media, therefore, as it relates to the application of the communications process in extension education. You probably are all familiar with this simplified diagrammatic outline of the process. Even so, I would like to run through it briefly, since my interpretation may be slightly different from others.

Slide 1. For communication to take place, there must be a SOURCE of knowledge or information. From this source, a particular MESSAGE must be selected and treated by a SENDER before it is transmitted via a specific CHANNEL to an identified AUDIENCE from which we hope to receive a desired RESPONSE. Let's elaborate a little further and relate this process to our job of extension education.

Slide 2. We can rather easily identify the original SOURCES of information and knowledge used in our extension programmes. The three most important are (1) research results, (2) observations, and (3) personal experiences. To me, these are the real sources. It is rather common, however, to identify sources with particular people, and there is nothing wrong with this so long as we don't confuse the source of information with the sender of information or confuse source with channel. Unfortunately, this mistake is made rather frequently, as we will see later.

Slide 3. From our choice of sources, we can select three categories of messages. We can select and treat a MESSAGE (1) to inform, (2) to motivate, or (3) to instruct. The purists will say that there are many other kinds of messages, and there are, but these are the three with which we are most concerned in extension. Most messages, of course, have a combination of purposes.

Slide 4. In the broad field of agricultural information workers in any one of the following four broad areas may be SENDERS of educational information. A sender may be associated with (1) State or federal governments, (2) colleges or universities, (3) farm organizations, or (4) commercial concerns. Here again we would not object to adding other 'senders' to the list, and certainly 'other farmers', 'neighbours and friends', and 'relatives' could well be considered as important information senders. The particular list is not important, but it is important that we clearly distinguish between the sender of information and the channel through which the information is sent.

Slide 5. The key to this discussion of the role of mass media in extension education is CHANNEL. Any person concerned with the transmission of knowledge and information from source to audience must use one or a combination of three general channel groups. He can select a person-to-person channel, a group channel, a mass channel, or a combination of the three.

Slide 6. His choice may depend upon the kind of message he wants to send and the identification of the AUDIENCE he wants to reach. This audience may be composed of (1) adult farmers, (2) youth farmers, (3) leaders, (4) non-farmers, or any combination of audiences.

Slide 7. Finally, his choice of channels may depend, too, upon the kind of RESPONSE he wants from the audience. Does he want his audience (1) to know, (2) to think, or (3) to act?

Slide 1, repeat. This admittedly is a rather brief and elementary review of the communications process, but it is a necessary background against which we can reflect our discussion of the role of mass media in extension.

For the remainder of this paper, I would like to confine my remarks to one phase of extension education — the transmission of educational information from sources to audiences. This assumes that we have a sound extension organization and a competent staff; that we have followed adequate procedures for determining the wants and needs of local people, and that we have accepted Mr. Maunder's excellent advice on programme planning and development.

Our problem in extension is not that we lack sources of information. Our research, our observation, and our experiences furnish a vast reservoir of knowledge that is rather readily available for transmission to our audiences. Although we would always welcome more staff members in extension work, we already have a rather sizable number of senders of information. This does not seem to be a major problem at the moment. Neither can we say that our problem is concerned with lack of audiences, failure to identify particular audiences we want to reach, or confusion with respect to what we want these audiences to do. We seem to be doing a pretty good job in these areas.

Slide 5, repeat. As we look again at the elements of the communications process and the job of extension, it becomes increasingly clear that our primary concerns are involved with channels of communication. Whether we are administrators, subject-matter specialists, or field workers, we are continually plagued by two persistent questions:

1. How can I use my time and resources most effectively in reaching people with the information they want and need? In other words, which channel or combination of channels should I use in my job of getting information to my audiences?
2. How can I improve my effectiveness in using the channels that I do select? Put another way, how can I improve the effectiveness of my meetings, farm visits, tours, newspaper articles, and radio broadcasts?

If I or anyone else attending this conference could give precise, accurate, and final answers to those questions, fame and fortune would be ours for the asking. Unfortunately, there are no final answers, although we know more today than we did yesterday. Fortunately, we will know more tomorrow than we do today.

For the most part, we in the United States, and I suspect you in Australia, have been 'flying by the seat of our pants' when it comes to the selection and use of extension methods. This certainly does not mean that we have always been wrong or even that we have been wrong most of the time. At the same time, we would be hard put to it to prove that we are right most of the time.

All of us in extension are inclined to use those methods in which we feel we have the most competence. Since we have been TALKING to people all of our lives, we are inclined to rely on the person-to-person, face-to-face methods. We go in heavily for meetings, tours, farm visits, night schools, and other personal and group channels. These methods tend to make up the hard core of extension work. In the same way, most extension workers have not had training in the use of the mass media and don't feel comfortable or competent as news-writers, radio broadcasters, or television performers. So these methods are ignored or used to only a limited extent.

Ask many of our hard-working extension workers in the States why they don't make more use of mass media and they are likely to say that they 'don't have time'. They HAVE time to arrange for and conduct meetings, visit farms, talk with farmers in the office, hold tours, and do many other things. But they 'don't have time' to write stories, prepare broadcasts, or appear on television. I suspect this same situation may hold true in Australia. This, of course, is a rather unsound and illogical basis for selecting channels of communication, and most of our extension workers would admit it. If we are to improve the situation, however, we must continually seek answers to the two questions we raised earlier: what basis do we use for selecting channels, and how can we improve the use of the channels we select? The best we can do at this time is to review the limited amount of research that has been done on the subject and to hope that considerably more research will be done in the future.

In the United States, and I suspect in Australia, we owe the rural sociologists a debt of gratitude for giving us some research leads on the question of why and how farmers adopt new practices and ideas and where they get their information for them. But having tipped our hat in appreciation to these scientists, we also reserve the right to quarrel a bit with both their research methods and the conclusions they have drawn from their findings. Most of you, I'm sure, are familiar with the work of such men as Wilkening of Wisconsin, Lionberger of Missouri, Rogers of Ohio State, Bohlen and Beal of Iowa State, and a number of others who have contributed to the general concept of the diffusion process in the adoption of new ideas and practices. Even so — and even though many of you have seen or used this pictorial presentation — I would like to review the work of the sociologists briefly and make some side comments along the way.

Slide 1. These slides, incidentally, were prepared by Drs. Joe Bohlen and George Beal of Iowa State University and used by the National Project in Agricultural Communications.

Slide 2. The findings are based upon an analysis of 35 research studies, some of which are indicated here. All of us probably agree with the five stages of the diffusion process as identified by the sociologists. They seem logical and jibe with our own observations and experiences.

Slide 3. First, there is the AWARENESS stage, when a person first knows about an idea or a practice.

Slide 4. This is followed by the INTEREST stage and the seeking of additional information.

Slide 5. Then comes the EVALUATION stage, when the person mentally matches the idea or the information against his own situation.

Slide 6. If a person is satisfied with his evaluation he is ready to move into the TRIAL stage, which calls for some physical action or effort — usually on a small scale.

Slide 7. And following this trial stage, if it is successful, he moves into the ADOPTION stage, where he considers the practice a part of his operation.

Pertinent to our discussion this evening is the work of the sociologists in relating what they consider sources of information to the various stages of the diffusion process. It is in this area that we are the most uneasy regarding the implications of the analysis and with the studies themselves that formed the basis for the analysis. Let's look at their conclusions first and save our rebuttal for a little later.

Slide 8. In analysing the 35 studies, the sociologists identify four general categories of 'sources' of information: (1) mass media, consisting of farm papers, magazines, newspapers, radio, and television; (2) government agencies, including extension workers, agriculture teachers, soil conservationists, and others; (3) neighbours and friends; and (4) commercial salesmen and dealers. Note that we are using their interpretation of the term source here and not the interpretation we used earlier. We will come back to this later.

Slide 9. The various studies support the conclusions that the mass media are the most important sources of information at the AWARENESS stage, followed by government agencies, neighbours and friends, and last by salesmen and dealers.

Slide 10. Mass media still rank first at the INTEREST stage, and the remaining order also is the same — government agencies, neighbours and friends, and salesmen and dealers.

Slide 11. At the EVALUATION stage, the rank changes. Neighbours and friends have moved into first place, followed by government agencies, then by mass media, and last by salesmen and dealers.

Slide 12. This same rank holds for the TRIAL stage, although there seem to be variations between practices, depending upon their complexity.

Slide 13. Personal satisfaction proved the most important influence factor at the ADOPTION stage, although the farmer might look to any one of the four source categories for confirmation of his experiences or for interpretation of the results he obtained.

I know that Drs. Bohlen and Beal and their colleagues in the field of sociology would be the first to say that the above analysis is an over-simplification of a rather complex process. And they probably share my uneasiness about some of the studies and their conclusions.

My first concern is that most of the studies were opinion recall studies after the fact. Farmers were asked to recall how, when, and from what source they received information on a practice. This information was then correlated in terms of their current stage in the diffusion process. We would agree, I think, that farmers who have been following a practice for several years would have difficulty in recalling with precision when, where, or how they first became aware of the practice. How many of us here could accurately identify the source of information that led us to purchase the car we drive or the brand of clothes we wear? Second, the studies were based upon a *status quo* balance with respect to information source emphasis. They measured the past combination of information methods as related to a particular practice or idea. Would the picture have been changed, for example, if twice as much effort had been spent on communicating information about the practice via the mass methods? Or if only half as much effort had been spent? My biggest concern with the studies, however, is that comparisons are inevitably made between CHANNELS of information and SENDERS of information. Perhaps this is merely concern with semantics, but I don't think so.

I submit that the mass media are CHANNELS of information and not sources or senders. At the same time, it seems to me, the extension worker is either a source or a sender of information, but he himself is not a channel. In my reviews of the literature, I have been unable to find many instances where this important distinction is made. Studies that compare channels with senders or channels with sources must inevitably confuse the real problem that faces us. How do we interpret a comparison between extension workers and newspapers, for example, when the information in the newspaper may have come from the extension worker? One is a sender and the other is a channel. By the same token, what meaning do we attach to a comparison between a research worker as a 'source of information' and a farm magazine when the article in the magazine was written by the research worker?

How far have we gone in answering our real problem when we merely give a rank order of importance to 'neighbours and friends' as sources of information unless we know how the information is channelled from neighbours and friends? Suppose I write a personal experience story for the country newspaper about a local farmer and his experiences with a particular practice. A neighbour reads the story and adopts the practice. Later, when I ask him where he got his information for that practice, does he credit the newspaper or the local farmer? Regardless of which answer he gives, my study will be in error because I was attempting to compare two different things. The same kinds of questions must be raised when we consider the comparison of 'salesmen and dealers' as sources of information. How do we assign credit when the salesman or dealer uses advertisements in newspapers or magazines? Actually, the salesman is the sender and the newspaper or magazine is the channel.

The point I would like to stress is that we will continually be led into this kind of quandary so long as our research attempts to compare sources or senders of information with channels of information. Each performs a distinct and different role in the communications process.

To be most helpful to extension, our research must be designed and refined so that we compare the effectiveness of various channels while keeping source, message, sender, and audience constant. Given a specific message to transmit from a particular source to a specified audience, the extension worker needs to know whether he should use the channel of meetings, local newspaper articles, farm visits, radio and television, or a combination of different methods. On the other hand, we can turn the research problem around by keeping the channel constant and varying the message to determine the type of message best suited for each particular channel. Such research should give us a better idea of the type of information that is best suited for each mass medium or for mass media in general. Using still another approach, we can keep both the channel and the message constant and study the effectiveness of different senders of information. If we want to get across some specific information on a new sheep ration via radio, for example, is it best for the information to be presented by an extension specialist, a research worker, or a farmer who has tried out the ration?

Until additional research can give us more precise answers to these types of questions, we in extension must interpret the role of mass media in extension education upon the best set of hypotheses that we can devise. We will have to base these hypotheses upon experience, logic, judgment, and careful analysis and interpretation of the research that has been conducted. If extension hopes to maintain leadership in the educational field, however, we must insist that these hypotheses be tested with soundly conceived and executed research studies.

Each of you at this conference can compose your own list of hypotheses, but I would like to suggest the following:

1. Mass media can be more effective and efficient than other channels in creating an audience AWARENESS of and INTEREST in any new practice or idea. This certainly is one of the main lessons we should learn from the diffusion studies.
2. Mass media can be used effectively when the objective is to help a farmer INTERPRET the results of a practice at either the TRIAL or the ADOPTION stage of the diffusion process. We can use newspapers or radio to explain to farmers why and how the weather affected the response they received from applying certain fertilizers or from planting certain crop varieties.
3. Mass media constitute effective communication channels when the purpose is to transmit information on a simple type of practice change.
4. Mass media should be equally effective when the purpose is to improve a practice already being followed.
5. When the type of change involves a complete innovation or a change in enterprise, the mass media are effective at the awareness and interest stages, but their effectiveness decreases at the evaluation, trial, and adoption stages.
6. The use of mass media adds the authority and acceptance of the media to the authority and acceptance of the extension worker.
7. The effectiveness of mass media is directly related to the extension worker's confidence in the media and his skill in using the techniques required by the media.

I would like to comment for just a moment on this last hypothesis. I mentioned earlier that few of us like to use methods with which we are unfamiliar or in which we lack technical confidence. In Illinois we have been seeking reasons why some of our extension workers make extensive use of mass methods while others do not. Jon Greeneisen, formerly of our staff, compared the 10 high users of mass media with the 10 low users. On most counts he could find little difference between the two groups. Their ages averaged about the same. They had about the same academic background, had made about the same grade averages in school, and had been in extension work about the same length of time. But he did find one major difference: nearly all of the high users of mass media either had taken one or more journalism courses while in college or had done special post-graduate work in some phase of communications. Only a few of the low users had received special training in communications. While we are not ready to draw final conclusions from this one study, we suspect that the relationship is more than a coincidence.

In the United States, until quite recently, we have sadly neglected both college and in-service communications training for our extension workers. I note from the working papers prepared for this conference that a number of your States hold regular in-service training conferences for extension workers and that communications subjects are included in these conferences. It may well be that you are ahead of us in this important area — and I certainly hope so. At the same time I cannot help but note that you are probably not ahead of us in designing college and university curricula for future extension workers. If this observation is correct, we need to work harder in this direction both in the United States and in Australia.

And I'm sure I need not urge further that communications subjects be included in all such curricula that are developed.

Up to this point — and I'm almost through — we have been talking primarily about the individual extension worker's use of mass media as one of the channels in the communications process. Let's step back for a moment and see where mass media fit into the total scheme of extension education.

The primary role of mass media should be as a working partner in a carefully planned extension programme. As Mr. Maunder has pointed out, such a programme plan starts with local people and the careful determination of their problems and needs. From this base, we consider the various alternatives for solving the identified problems, and we evolve a plan of action to provide information to help local people solve their problems. The mass media then become one of our tools for providing this information. With such an approach it follows logically that those responsible for mass media must be involved in the programme-planning operation itself. It is not enough to turn to the information specialist at the last minute when there is need for a news story, a radio programme, or a special publication. To operate effectively, the information specialist should be a recognized member of the programme planning team. In addition to supporting carefully planned educational programmes, the mass media should play a role in the continuous dissemination of timely, seasonal, educational information. We can and should use press, radio, and television to maintain a steady flow of information on new varieties, fertilizer recommendations, feeding rations, weather conditions, market situations, and general farm operation matters. In a more subtle way, the mass media can and should play an important role in keeping our urban audiences informed about agriculture.

Since I am aware that even person-to-person communication is often difficult, let me briefly summarize my remarks:

1. Extension comprises an educational system where our objectives are to increase the level of knowledge and change the behaviour of the people in our audiences.
2. This educational system involves the continuous application of the communications process, and the mass media comprise one of three channel groups available for getting information to people.
3. To be effective, the use of mass media must be incorporated into all stages of programme planning and development.
4. To use mass media methods effectively, extension workers must be keen students of the communications process and develop skills in mass media techniques and methods. To improve these skills, we need to provide better communications training programmes either at the college or university level or as a part of our in-service training operations, or both.
5. We must initiate and carry out soundly conceived programmes of communications research in order to improve our use of mass media methods.

Again let me say that I am sincerely pleased to be a guest at your stimulating conference.

PAPER 117

MASS MEDIA — IS IT AN EMPTY CARTRIDGE IN A HIGH-POWERED GUN?

By A. E. ENGEL*

If I were a farmer in South Australia the chances are that I would read about or hear something of my work from the Department of Agriculture at least once a week; that is, of course, provided I read my daily newspapers, my local news sheet, my rural weekly, and listen to my radio at the right time. There are available to me, too, the District Advisers and the local branch of the Agricultural Bureau.

Despite these services, preventable losses still occur in cereals, pastures, and livestock. Certainly these are not as great as would be expected had extension programmes not been in existence. The Department has instances of thousands of acres of pasture being saved from pasture pests in a specific area; in another area, fruit-growers continually look to their horticultural adviser's recommendations through local press and radio. These instances repeat themselves frequently. But we still have resistant customers, and we must ask ourselves, why? In the first place we must explore every possible source of breakdown, but for the purpose of this paper the remarks will be confined to mass media.

Three cardinal characteristics are fundamental to any 'impact' mass media programme — use of motivation research findings, highest-quality material preparation, and most thorough planning. These fundamentals have been recognized and used overseas. A programme built on coordination of the fundamentals can be likened to the firing of a gun — the material we fire at people, its quality, and the way we fire it provide the 'impact'.

Motivation Research

Perhaps less is known in Australia about this subject than about any of the public relations disciplines. Agricultural advisory staff can make claim to a knowledge of some practical aspects of the subject. They learn from experience the multiplicity of reasons why individual farmers will or will not accept a particular plan. Unfortunately, however, they are not formally trained in social psychology, nor do they receive assistance from social psychologists, so weaknesses are inevitable. The lack of information is much more apparent in mass media. In considering presentation and style of written matter, and in particular the South Australian Journal of Agriculture, some of the essential data we do not know, and should know, rapidly emerge.

Average educational level of the farming audience in this State is believed to be somewhere in the region of second year in secondary education — but this is only a guess. Next — are the farmers an emotionally charged group? In some respects we believe they are; otherwise why would they choose that way of life, when their assets invested in commerce would give a much higher return? Then, what are the factors in a technical journal that will make a group of farmers anxious

* South Australian Department of Agriculture.

to sit down, read it, and digest it? How important in a group is the competition for reading time? What words or phrases do particular groups of farmers like or dislike? These are just some of the questions foremost in our minds. In our abyss of ignorance we can only fall back on the shallow knowledge of practical experience. It is believed that a 'prestige' style Journal gives reasonable assurance of farmer acceptance. But at the same time we also believe this must be backed by 'copy' of high readability, short articles and narrow columns for ease of reading, plenty of white spaces around the articles, ample illustration for interest, simple but powerful 'heads', and a colourful cover to induce readers to open the Journal. As a yardstick of audience acceptability, we can say that there has been a 50% increase in the subscriber list to the Journal in the four years that these ideas have been built in.

Motivation in press work is even more complicated. Acceptance rate depends on our ability to 'tag an angle' to as many articles as possible and to write according to the local prescribed style-sheet. So to obtain acceptance we actually have to motivate the press editorial staff. During the past five years the two daily newspapers in Adelaide have each used 30% of our releases and the rural weeklies have taken almost 100%. In radio and television, motivation factors are equally enigmatic, especially when considering the complex nature of agriculture alongside soap powder, cosmetics, and the like.

For these reasons, it may well be judged that the cartridges we use are only partially charged, depriving us of the impact that might be possible in our programmes.

Highest-quality Material Preparation

The second factor affecting impact, quality or presentation, is yet another aspect exercising the minds of serious thinking extensionists. In mass media extension of agriculture there are two presentation phases, the technical matter and the medium. Staff training and supervision generally take care of the technical side; on the other hand, our experience suggests that in-service extension schools only partially fill the gap between good and mediocre presentation, except when an officer has a natural ability in using the media available. This observation is particularly applicable to writing, photography, and to a lesser extent to broadcasting.

To overcome the problem at least in part, the staff photographer is used as much as possible for Journal illustrations; the Editor, too, both checks and attempts to improve copy — but there is a limit to which he can effect changes. Whether employing professional writers would improve acceptance and warrant the cost will remain a matter for future consideration. In the meantime, we use to best possible advantage our good writers and our not-so-good writers. Because radio talks are better delivered in a natural conversational style, preparation and delivery apparently come more easily to our staff with experience. Regional officers are usually well known to their listeners and are perhaps better left alone; but headquarters staff, speaking as they do to a wide audience, are encouraged to give a smoother and more polished delivery. The Department's Royal Show exhibit is but another medium to come under fire for quality of presentation. Until recently all the stands were designed by our officers and then erected by a commercial display expert. The results were somewhat amateurish in their effect. To overcome this weakness a commercial designer now completely develops the exhibit on the basis of written matter prepared by staff; the effect has been most gratifying.

In general terms, however, quality and style of preparation are objects of subjective thinking — we have to project the things we think our audience will like into the material. How easily could this become a projection of our own personal like. There is no Australian information to guide us, and once again we have to fall back on practical experience; it is as though we are aiming our gun at a blurred image. Nevertheless, we can and do aim at as broad a spectrum of the farming group as possible, using various media in coordination. This is the basis of our programme planning.

Programme Planning

Further, the planning we use envisages repetition of the message to individuals through various media in a short space of time. Each of the six Branch Heads annually prepares an extension programme for the ensuing year. From the sample Aim shown, drawn from more than 20 'Aims' prepared by the Agriculture Branch for 1962, it will be noted that both mass and group media are integrated.

AIM 7: TO GET MORE FARMERS TO RENOVATE OLD CLOVER PASTURE

PRESS AND RADIO	Points to watch in autumn sowing	March '62
	Getting ready for spring sowings	July '62
	Points to watch in spring sowings	August '62
	Success stories	Nov. '62–Feb. '63
	Perennial grasses for old sub clover pasture — Cocksfoot Phalaris Perennial ryegrass	March '62
JOURNAL	Use of diquat in pasture renovation — (Authors: Ross and Tideman)	January '62
BUREAU AND FIELD DAYS	Mr. F. Meissner — Meadows — Capeweed control	September–October '62
DEMONSTRATIONS	As arranged with Pasture Improvement Committee	

On receipt of all the programmes an extract is made for each medium. The press officer scouts the Branches at the appropriate times for releases. Regional centres are visited at the beginning of each year and 12 months' broadcast talks are developed out of the programme. Every officer is informed of his Journal commitments for the year. Action is also taken over group commitments. As a result, we believe, impact is obtained.

Admittedly, some elasticity is essential: experience has shown this; but in general the execution of the programme as a whole runs fairly smoothly. It must also be realized that from time to time unprogrammed 'snippet' announcements are made; these satisfy special needs. Additionally to this form of programming, occasionally a high-itensity information service is run for a few weeks. In the 1959/1960 drought two services were implemented, sheep management and soil conservation. Usually a single story is processed through every available medium each week. This takes a considerable amount of organizing and places quite a strain on the media.

In conclusion, one might describe 'planning' as putting structure and substance into the South Australian Agricultural Extension Service — we at least reach the numbers of people with our cartridge pellets; some of these pellets are perhaps not sufficiently effective, but future recognition of the needs may overcome this problem.

PAPER 126

SPECIAL INDUSTRY PUBLICATIONS

By G. W. Gayford, K. M. Sillcock, G. Mattingley, and D. M. Flynn*

The history of the production of special industry periodicals in the Victorian Department of Agriculture commenced with the Dairyfarming Digest, which was first produced in 1954 with funds made available from the Commonwealth Dairy Industry Extension Grant. The Commonwealth Extension Services Grant, under which funds were available for extension projects not previously possible with State funds, enabled the Department to extend this method to other industries.

The digests are distributed free to all farmers in the industry concerned. For instance, those eligible to receive the Dairyfarming Digest are farmers in Victoria who milk ten or more cows. These include, of course, farmers who have other interests, such as woolgrowing, fat lamb raising, beef production, and potato growing, in conjunction with their dairying venture. Similarly, the Livestock Digest is available to Victorian farmers who run sheep or beef cattle, or both, as part of their farming venture. Thus, in this paper, the term 'industry' is used to denote a type of production rather than a type of farm. The present situation regarding digests is shown in Table 1.

TABLE 1

Digest	Format	Pages	Issues per annum	No. on mailing list	Costs (per annum)	
					Production	Mail
Dairyfarming	Letterpress	40	6	22,500	£4,980	£594
Livestock	Letterpress	32	4	19,000	2,800	266
Mallee Horticulture	Letterpress	32	4	4,234	1,160	100
Victorian Horticulture	Letterpress	32	4	4,546	1,320	108
Potato Growers	Letterpress	20	2	5,500	486	54
Vegetable Growers	Offset	32	4	1,975	280	62
Beekeepers	Offset	12	4	1,500	28	45

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* Victorian Department of Agriculture.

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Editorial Policy

The contents comprise topical advisory articles on technical subjects, reviews of research work, progress reports on research trials and current work being undertaken at research stations, and descriptions of practices being successfully applied on growers' properties. The authors of articles are drawn from the full range of research, extension, and regulatory officers. The articles are short and concise and in some instances may be precis of longer research reports appearing elsewhere. Features aimed at are easy readability and appropriate illustrations. Ample use is made of line drawings to illustrate equipment. A comprehensive photo file system is in operation to supply illustrations.

The operation of programming and collating the Mallee Horticulture Digest is almost entirely a function of the Senior District Horticultural Officer in charge of this region. As a result, this Digest has a particularly regional flavour, with the authors of articles being personally acquainted with a large number of the readers. Consequently the publication has a big impact on the industry in this region.

Industry publications overcome some of the difficulties of the Agricultural Journal, which covers all industries, in that they can be more specific and written on a local level, and the articles are written for the farmers in farmers' language. There is no commercial advertising matter, or long tables, or lists of stock foods, fertilizers, etc. which are of necessity published in State journals. The format of a small journal on good paper with attractive set-up has made a favourable impression on the reader.

Assessment

No special survey has yet been made of the extent to which these publications influence farmers' actions. Nor would such an assessment be easy; for the Digest is usually one of several avenues through which an idea reaches the farmer. Probably its chief function is to create initial interest in or knowledge of new ideas, which are then discussed by farmers between themselves and with advisory workers. A high value was placed on a similar publication (M.I.A. Farmers' Newsletter) in the report by the B.A.E. on evaluation of extension services in the Murrumbidgee Irrigation Area. It was estimated that this publication influenced 68% of farmers. This was the highest rating given to any of the media. Similarly, in sociological surveys taken by the University of Melbourne in the Warragul and Rochester districts, the Dairyfarming Digest was rated highly by a large proportion of the farmers interviewed. This is borne out by many reports from Dairy Supervisors as to the high value placed on this Digest by farmers in their districts.

An implied compliment is paid to the digests by editors of papers with a rural circulation. Not only are they anxious to receive the digests, they also reprint many digest articles in their own journals, although the articles will have already reached many of the farmers chiefly interested in them. This they are at liberty to do, under the copyright conditions, provided the author and the Department are acknowleged. Several other very definite leads to industry opinion of Victorian publications have been obtained. In recent years shortage of funds available for publications necessitated a reduction in numbers of both the Victorian and Mallee Horticulture Digests from quarterly to half-yearly issues. The response was immediate from all interested grower organizations, who first requested restoration of quarterly issues and later offered financial assistance. Increased funds have subsequently made possible a return to quarterly issues. Many complimentary letters have been received from industry organizations concerning the digests.

A noticeable reaction, particularly in the Mallee region, has been the increased demand on officers' time for farm visits which follows many of the issues of Mallee Horticulture Digest. This is particularly marked when a new practice is described in the Digest. In other words, mass media have not replaced farm visits, but have actually increased the demand.

Value to Authors

Many of the articles written for digests are supplied voluntarily by advisory and research staff, but some articles are solicited from officers in order to keep the digest in balance. The need to set down ideas on paper in logical form has a beneficial effect on the authors. They have, of necessity, to crystallize their ideas and relate them to practical farming practice. Over the years a marked improvement has been noted in the items submitted by regular contributors. The regular publishing of articles in such journals builds up the prestige of individual advisory officers as well as that of the Department as a whole.

The articles to be published all have to go through a thorough screening process. This means that new recommendations have to be fairly thoroughly scrutinized and discussed by senior officers before they are published; thus the availability of such a medium often results in new information being more quickly passed on to the farmer than would occur otherwise. It also means that information so published keeps all advisory staff informed on technical progress. The screening process itself brings younger extension workers, who have written of their field experiences, into contact with older officers who have had special experience in the same subjects, with benefit to both the younger and the older worker.

A regular publication enables an author to tell his story a little at a time, and to add to or modify it in the light of further experience. The author's work is more easily read by farmers in this form than it would be if collected into one long paper — which, in any case, may soon be out of date in some details.

PAPER 133

COUNTRY TELEVISION — AN OPPORTUNITY AND CHALLENGE TO EXTENSION WORKERS

By C. WEBB and J. P. BRIEN*

The commencement of transmission by four country commercial television stations in Victoria — the first country stations to operate in Australia — during late 1961 and early 1962, plus the likelihood of more country stations in that State during the next few years, has thrust a great opportunity and challenge on agricultural extension workers.

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* Victorian Department of Agriculture.

As a medium, television combines some of the best features of face-to-face communication with those of the mass media and, from experience in U.S.A. and elsewhere (1), there is no doubt that this medium will give great opportunities to extension workers. Its influence will also make it necessary for an extension worker to replan his activities, particularly with respect to priorities, to the new environment which the medium has created. Administratively, non-participants such as senior officers must be fully aware of the possibilities and problems of this medium.

Officers of the Department of Agriculture, Victoria, have contributed for several years to ABV-2 Melbourne's rural programmes and the experience has been valuable. But country television, with its markedly different audience patterns, requires even more careful planning by our extension workers to make its use effective.

Assuming that television has a great impact in his area, an extension worker's greatest problem is to determine how he can use it to the best advantage in relation to his present programme and resources. These problems are being faced already by the Department of Agriculture, Victoria, which has participated with the three initial country television stations — BCV 8 Bendigo, GMV 6 Shepparton, and GLV 10 Traralgon — since each began its series of test patterns before the official opening dates. Participation has included the provision of feature films produced by the Department of Agriculture, weekly film clips on timely subjects, and regular personal appearances by extension workers.

Since December 28, 1961, BCV 8 has made available to the Department a regular ten-minute period every week. This has been compered by Mr. Bruce Crouch, B.Agr.Sc., a district agricultural officer, and an extension worker has provided a session each week. Typical subjects have included efficient ways of using water in a dry season; ventilation for poultry flocks; the control of footrot in sheep; the production of pure milk for an urban community; and quality in pigmeats. Most of the participants have been members of the Bendigo District Agricultural Centre, or other Centres within BCV 8's viewing area, with occasional help from Melbourne-based specialists. Ten of the first thirteen programmes were presented by local Officers. Since February 1, 1962, the session has been extended to 15 minutes to include the presentation of current agricultural news. From April 4, 1962, the Department of Agriculture will begin a weekly ten-minute session with GMV 6, compered by Mr. J. McColl, B.Agr.,Sc., a Department of Agriculture extension worker in the area.

Already, the advantages of using a locally based extension officer to compere the weekly sessions are apparent — not only in developing that person as a 'signature' personality, but also in his relationship with the television company and especially his relationships with participants.

'Hosting' a television programme should not take an extension officer more than two or three hours a week of his official time. However, as most extension workers in the field had full programmes before the advent of country television, the new medium calls for some drastic adjustments which, unless additional skilled help is available immediately, could mean the adaption, reduction, and perhaps the elimination of some activities. For instance, all agencies which have mobile film projection units in the field must face the probability of reduced audiences if their function is merely to screen a series of instructive and entertaining films. But let us remember that in one screening on television a film could reach more viewers than it could in three audiences, of 50 persons each, every week for a year. It is emphasized that this comparison is necessarily between television and a straight programme of films. The use of films to supplement a talk or discussion, led by a specialist, maintains its value.

Correctly used, the mass medium of television can reduce the need for many personal calls of the day-to-day query type, but on the other hand it can greatly stimulate demands for other extension services. However, whatever happens, there will be an urgent need for such adjustments to each individual's programme so that any losses can be minimized and gains can be maximized. At the same time, an extension worker's resources will be one of the most important factors limiting his use of television. The time available to him on the screen and his ability to use it will determine his needs and play a big part in the extent to which his vocational programme will have to be adjusted.

The high cost of time on television will probably deter most extension agencies from buying it, especially during the initial stages when most of the year's appropriations have been committed. The use of sponsorship by an outside organization will depend on the extension agency's policy. The other possibility is the allocation of time by the television company as a service to its viewers. This has occurred already in Victoria and could well be repeated on all country transmitting stations. Extension workers participating in these programmes should give careful consideration — in association with station opinion — to the type and interests of the audiences which tune their sets to the station at that time. The extension officer's skill in demonstrating provides a natural high-class 'live' attraction to television companies, but his chances of using such time depend greatly on his ability to give performances of such a high standard that they will not only serve his particular purposes, but also attract viewers to the station against the opposition of competitors.

In any case, preparation for a television programme is much more stringent than for a radio programme and even the simplest television performance involves much more than merely focusing a camera on one or more persons. For this reason, the time requirement for television includes not only that of the actual performance, but also the period of preparation, involving carefully timed scripts, the provision of aids, and rehearsal, which is usually much longer per minute of performance than for radio. Without aids and associated thorough preparation, an extension worker could gain comparatively little from television. He might even lose ground.

The need for these aids emphasizes the requirement of a number of skilled supporting technicians, including artists, makers of models, photographers, and processors of film — each of whom will be subject to the additional demands on time and finance made by television. Many of these services can be purchased, but, apart from the cost, it is more desirable for them to be under the same administration as the television performer, especially in view of the need for high quality and timeliness.

It is probable that such support to the extension worker would have to be provided by a unit based in a capital city, or at least a well developed regional centre. Part of the support could come from each. Either of these places, therefore, would come under additional stress — administratively as well as for staff, time, and money. In addition, such a resource would have to attend to many other details, such as still pictures, slides and models, the design and purchase of containers for films, script writers to provide shot lists and background information for films, an indexing service, a survey team to measure the effect of performances, and clerical support. However, the cost of the services of such a supporting unit can be spread over many extension workers, and need not be confined to television. In the first place, one film, e.g. of farm machinery maintenance, could be used over most television stations in a State and, if suitable, exchanged throughout Australia in much the same way as many films are screened by film units throughout the Commonwealth. It could also be used by film projection units. Most of the other aids could be distributed in the same way. In such a case, there would be a strong need for coordinating and advisory services to keep extension workers informed about what aids were available.

Eventually, it might be possible for a central unit to provide a certain number of packaged programmes a year. Nevertheless, as with the other media, it would be far more desirable for a local extension officer to participate regularly in programmes telecast in his own area than to rely too much on packaged programmes or other information from elsewhere.

For this reason, and despite the value of the previous development of other skills, some preparatory training is a necessity. The introduction of television techniques to in-service training programmes — most of which already include public speaking, demonstrating, and script writing — would be vital. Some other background information such as the peculiarities of television and film production would also be useful. With such training in addition to their normal activities, most extension workers should have little difficulty before the television cameras. However, the need for such training is urgent, especially in view of the value of an extension agency becoming established in the early programming stages of a television station's activities.

Granted some television programming can be done simply and cheaply, but, to reap the many advantages which television undoubtedly offers, an extension worker must always be prepared to use it regularly and skilfully. Such use sets off a train of demands on an extension service's resources which every officer must appreciate thoroughly before he can assess what use he can make of this medium and, consequently, how his normal programme must be adjusted to take full advantage of the circumstances. Without such an assessment, an extension worker's entry into television could be chaotic and, perhaps, unfortunate. On the other hand, adequate preparation and assessment could raise the value of an extension worker's influence to a far greater degree than its additional requirements imply.

The future of television in Australia is bright. Already, proposals have been made for the establishment of an educational television system in this country. If the Australian Broadcasting Control Board gives approval to its introduction, agricultural extension workers will be presented with an even sharper television link with rural communities than at present envisaged, and the experience they gain in this phase — country television — will be of inestimable value.

REFERENCE

1. BRIEN, J. P. (1960).—'The Challenge of Communication in Agriculture.' (Department of Agriculture: Victoria.)

THE USE OF MASS MEDIA TO SUPPORT EXTENSION EDUCATION IN ILLINOIS

By HADLEY READ*

In the States, when a man seems exceptionally confident of an opinion or a point of view, we ask, 'Yes, but will he put his money where his mouth is?' You probably have a comparable Australian challenge.

After hearing me speak so confidently last night about the general role of mass media in extension education, you have a right to ask for an accounting of how we in the States use the mass methods. You can ask whether we 'put our money where our mouth is'. There are a number of persons in the audience who have viewed our operations and who could perhaps answer this question more objectively than I. Before I attempt such a review, however, I would like to establish a number of ground rules.

First of all, I am using Illinois as the case study or typical example. This is not because I think Illinois has the most ideal or most effective communications programme, but because I am obviously best acquainted with the details of operation there. I can also criticize certain things we are doing without hurting someone's feelings. Our communications programme in Illinois, however, is very similar to the programmes in all the other states. In fact, I am one of the chief critics of this similarity among the various states. We seem to be the biggest copiers in the world. My second purpose for using Illinois as the example is that I would appreciate having your critical appraisal of both the things we ARE doing and the things we ARE NOT doing. My real purpose in coming to Australia is to steal ideas from you that we can use back home.

Slide 1. So let's take a look at the use of mass media to support extension in Illinois.

Slide 2. Illinois, as you know, is in the east-central part of the United States geographically, but near the centre from the standpoint of population. It's in the centre of what is commonly referred to as the U.S. Corn Belt.

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* Extension Editor, University of Illinois College of Agriculture, U.S.A.

Slide 3. In size, Illinois extends approximately 400 miles from north to south and 200 miles from east to west. The growing season varies by as much as three weeks from north to south. I saw my first cotton growing in the southern tip of the state.

Slide 4. Even though Illinois ranks near the top in agricultural production, we are an urban state, with a total population of 10,081,158. The farm economists count 123,318 commercial farmers. There are approximately 31,334 part-time farmers in the state. And the urban families total 2,087,046. The farm population makes up only 6% of the total population.

Slide 5. In Illinois, as in most states, this rural and urban audience is served by a vast network of mass media channels. These same channels are available for our use in extension. Within the boundaries of the state there are 90 daily newspapers, 648 weekly newspapers, 144 radio stations, and 21 television stations. In addition, there are a large number of papers and stations in neighbouring states that serve Illinois audiences, and we estimate that there are at least 32 state, regional, and national farm magazines and trade publications with significant circulations in the state. From these figures you can see that we are approaching the mass media saturation point, and there is keen competition among media for audience attention.

Slide 6. The agricultural staff of the Cooperative Extension Service totals 319. Of this number, 166 are extension workers in the 101 counties. (We call them farm advisers and assistants, and you probably think of them as county agents.) There are 93 extension specialists in 12 subject areas, agronomy and agricultural economics having the largest number. The administrative staff totals 43, and it is my task to ride herd on a staff of 17 full-time editorial workers.

It seemed to me that this brief background might be helpful in interpreting the organization and services of our editorial office and the way in which we use mass methods at both state and county levels. For the next few minutes, I would like to briefly sketch the organization of our operation and review the services that we maintain. Then, I will attempt to fit this organization and the services into our total extension educational situation in Illinois.

Slide 7. Administratively, our editorial operation is organized under six small coordinated divisions, assuming that you are willing to consider me an administrative division of one. The six people in our Media Services Division are responsible for the areas of press, radio, television, and direct mail. Four people in the Technical Services Division handle arts and graphics, photography, and exhibits and visual aids. The four editors in the Publications Division handle all printed publications. Field Services and Training and Teaching and Research are essentially one-man divisions, but both borrow the staff services of all other divisions. This may appear to be a rather sizable staff, and it is. It demonstrates, I trust, the emphasis that our administrators place upon the broad areas of communications services, teaching, training, and research, and the support they have given our operations. A number of states, including New York, Iowa, Pennsylvania, North Carolina, and Wisconsin, for example, have comparable editorial staffs.

Now that I have outlined our basic staff organization, let's take a look at what we do and how we do it.

Slide 8. The press section of our Media Services Division is responsible for all press services to the print media channels.

Slide 9. These services include a twice-weekly packet of releases to the daily newspapers of the state, a weekly packet to the weekly papers, a special monthly information newsletter to the farm magazines and journals, which also get a weekly selection of releases, and a special bi-weekly service of articles and pictures for *Prairie Farmer*, the state farm magazine that reaches more than 90% of our farm families. Each story or article is obtained from an extension specialist or a research worker on the staff and is approved by the authority before it is released. During a 12-month period the office will prepare, check, and distribute between 400 and 500 releases and between 100 and 200 photographs on agricultural topics.

Slide 10. The radio section handles four primary assignments.

Slide 11. Twice each week, a script containing 8 to 10 items is sent to all radio stations in the state, and this service is supported by a monthly radio newsletter. Fifty-three stations in the state or serving Illinois audiences receive our weekly recorded tape service, and each tape includes four or five brief interviews with an extension specialist or research worker. In addition, this section prepares and broadcasts a daily quarter-hour farm programme on the University's 5,000-watt educational radio station.

Slide 12. Although we have been doing television sporadically for about ten years, we were not able to establish a full-time farm television section until this year.

Slide 13. At present this section is concentrating on four primary areas. We arrange for regular 'live' appearances of our extension and research staff members on the local commercial television station and on other commercial stations within the state. We have also initiated 30- and 60-second filmed spot announcements that go to nearly all television stations on an irregular basis, and we are producing a limited number of 4- to 5-minute sound films on timely subjects. Our major effort for 1962/63 is a series of 13 half-hour landscape gardening films that will be ready for telecasting on January 1. These filmed telecasts will be closely correlated with the extension landscape gardening programme in the various counties.

Slide 14. As we are doing with television, we are gradually stepping up our direct-mail services to both farmers and agricultural leaders. Essentially we are concentrating on two types of letters. The regular subject-matter letter goes to leaders or producers on a regular weekly or monthly basis. A number of subject-matter departments are now preparing special fact sheets particularly for county extension workers, but also distributed to some extent to other agricultural leader groups.

When we move from Media Service to Technical Services, we find a somewhat different philosophy of operation. Here we are concerned primarily with internal services to support our total communications programme and special services for the state and country extension staffs.

Slide 15. The arts and graphics section of Technical Services includes a staff of three full-time artists.

Slide 16. They handle all art work for publications, motion picture and slide film productions, and visual presentation aids. This section is relatively new, but we are already unable to meet all the demands placed on us by the staff of the Extension Service and the College of Agriculture.

Slide 17. The photography section is also a relative newcomer to our group.

Slide 18. The operations here are essentially self-explanatory. This section is responsible for all news pictures and the production of all 35 mm slides and a limited number of motion pictures, most of which are used on television. We are now in the process of expanding our slide production services for county extension workers, and we expect to produce between 10 and 12 sets of slides during the coming year. These slide sets are made available to the counties without charge.

Slide 19. As you can see here, we have a modest visuals shop, which is devoted to the preparation of exhibit materials and other presentation aids.

Slide 20. Until recently we were spending most of our time in this area preparing exhibits for major fairs and festivals. We are trying now to shift our emphasis from such major expositions to smaller and more easily portable exhibits that can be loaned to the counties for local showing. We have about 15 such exhibits on inventory, most of which can be transported in an ordinary automobile. This section also handles all requests for various presentation aids, including scale models, flannelgraph presentations, scenery back-drops, and so on.

Slide 21. The responsibility for coordinating all of our communications services for our county extension staffs has been assigned to the Division of Field Services and Training. This one-man division serves as a coordinating catalyst to make sure we are devoting a proportionate share of our time and money to the communication needs of county workers. The county staffs receive copies of the information materials we send to media outlets, and in addition we prepare weekly packets of exclusive material for them to use in their local information programmes. This division also serves as a liaison in the production of loan exhibits, slide sets, and direct-mail materials. On the training side, the division coordinates our in-service training workshops on various aspects of communicatons and our preparation of communication training aids. Our primary effort in this area at the moment is the continuation of the Communications Handbook, which contains material on nearly all phases of communications.

Slide 22. In many ways we are most ambitious for the work in our Teaching and Research Division. On the teaching side, we are responsible for the instruction in agricultural communication in two undergraduate courses available to students of the College of Agriculture — and, in fact, to students of the whole University. This section also administers our programme for students who are majoring in agricultural communications. We have about 15 students enrolled in this major and are making an effort to increase the number. We are also rather proud of our agricultural communications research project, which, though modest, was one of the first federally supported projects in the United States. Since it was established in 1953, we have completed 14 specific research studies, most of them by graduate students at the master's level. In fact, one of the best studies was carried out last year by Gerald Smith of C.S.I.R.O. We have recently completed summaries of nearly all of these studies, and I will mention several of them a little later.

Slide 23. This is the Publications Division.

Slide 24. It is responsible, of course, for all printed publications of the Cooperative Extension Service and the Agricultural Experiment Station. During the period from July 1, 1961, through July 1, 1962, the staff of this section published 14 research bulletins and 18 extension circulars. These publications totalled 857 pages. This section also has the responsibility for publishing a quarterly magazine devoted to the reporting of agricultural research. I might say that Gerald Smith also conducted a research study on the audience acceptance of this magazine.

This review perhaps will give you a general idea of our broad organization and the communication services which we maintain. It would be most unfortunate, however, if I gave you the impression that we are a somewhat independent agency charged with the responsibility for grinding out press releases, putting on radio and television programmes, and issuing publications. Instead, we exist for the primary purpose of facilitating the use of mass media and visual aids in support of on-going extension programmes. In other words, the news stories we write, the radio programmes we broadcast, the publications we issue, and the exhibits we build are in support of specific extension educational programmes. Let me illustrate with a brief example of how this works.

First of all, as head of agricultural information, I am a member of three administrative groups. The first is called the Extension Administrative Council and consists of the extension director, three assistant directors, the head of extension training, the head of youth work, and myself. This Council works with the director on general matters of administrative policy. The second administrative group is composed of the Council plus the district leaders in agriculture and home economics and is called the Administrative Staff. It is concerned primarily with county organization and staff and county programme development. The third group is the administrative programme planning group composed of the director, the assistant directors, and the chairmen of the various project units, including information. As you can see, the inclusion of the head of information work in these administrative groups assures the coordination of information with the on-going extension educational programmes.

Recently, the county extension workers expressed a need for greater emphasis upon forage production and utilization. As a result, we established a special interdepartmental committee to plan and follow through on an educational programme. This committee was composed of representatives from the departments of agronomy, animal science, dairy science, agricultural economics, and agricultural engineering, and the head of the media services division of our office. Working as a team, this committee hammered out an educational programme which included a plan of action to bring the needed information to the farmers of the state.

Going back to our comments on the diffusion process last night, we were primarily trying to bring about improvements in practices already being followed. For the most part, we did not have to go through the awareness and interest stages, but could move directly to the trial and adoption stages. Our messages were intended to motivate and instruct, and we designed a programme to make use of both group channels and mass media channels.

In the first stages, the action plan called for a series of 2-day district winter meetings and a series of summer field demonstrations. To support the winter meetings, the committee outlined the following needs for information support materials: (1) a reference handbook covering all phases of the forage problem for use by the county extension workers, (2) a printed circular for distribution to farmers attending the meeting and for general distribution after the meeting, (3) a set of 35 mm colour slides on forage production and harvesting, and (4) a number of small portable exhibits on forage feeding for use at the meetings and for subsequent use in the counties. In addition, plans were made for the preparation of a packet of information materials for use by the county workers in publicizing the meetings themselves. Similar support materials were planned for the series of summer field demonstrations.

In addition to the support of these two series of events, a calendar of general information release materials was prepared by our office and approved by the committee. This calendar included general releases and articles for our press services, special feature articles for *Prairie Farmer* magazine, a series of tape recordings as a part of our radio tape service, and several television spot announcements for seasonal release. The use of the mass media channels helped assure us that we would reach farmers who would not attend our winter meetings or attend our field demonstrations.

The point I would like to stress here is that the information that flows out through the mass media from our services is actually the sum total of the material we have prepared to support the various educational programmes being stressed at any particular time. In addition, of course, we try to maintain a continuous flow of timely and seasonal material on a wide variety of topics that may not be directly related to an on-going programme of the moment.

Let's move now from the operations of our office at the state level and take a look at the use of mass media by our county extension workers in Illinois. Fortunately, we have some rather current data on this subject based upon a 1960 study by our office.

Slide 25. In the area of press services, we find that all county farm advisers send news releases to county newspapers. Of the advisers, 55% send releases weekly, 6% bi-weekly or monthly, and 39% irregularly. In 1961, the advisers prepared 25,615 news articles.

Slide 26. In addition to preparing news articles and releases, 76% of the advisers write personal columns for their local newspapers, and 69% do so each week.

Slide 27. Here we see that 62% of the advisers appear regularly on radio, 11% having daily programmes, 19% twice weekly, 23% weekly, 3% bi-weekly, and 6% monthly. These advisers made 9,511 broadcasts during 1961.

With an adequate staff and operating budget, it is not too difficult to turn out quantities of news articles, radio broadcasts, publications, and other communication materials. The next stage is to get the information used by the media. Although we do not conduct a continuous evaluation of the use of our releases and services, we do have evidence that the material is being used.

Slide 28. A survey in 1957 gave us the information that between 80% and 90% of the daily newspapers replying printed our releases regularly. In general, newspapers with farm editors used more of our stuff than papers without farm editors. Proportionately the weekly newspapers probably use more of our releases than the daily newspapers. On the basis of past surveys, we estimate that 85% of the weekly papers use our material and that between 30% and 50% will print any given story.

Slide 29. One of the biggest users of our material is *Prairie Farmer*, the state farm magazine mentioned earlier. In a 1959 study we found that *Prairie Farmer* used 973 column-inches of editorial material and 425 column-inches of pictures in a six-month period. This amounted to 26 full pages valued at more than $68,000, or six times as much space as was devoted to our material ten years ago.

Slide 30. What about the national magazines? Although the national magazines do not use many of our releases directly, these releases do serve as the source of information for staff-written articles. We studied the content of three national farm magazines in 1959 and found that information from the University of Illinois was used for 75 feature articles or short reports. The average was two articles per month in each of the three magazines, and Illinois ranked second to Iowa in total source mentions by the three magazines.

Slide 31. In radio, only those stations requesting our weekly tape service receive it. They return the tapes each week and usually indicate on a return form which interviews they have broadcast. When we attempted to discontinue our twice-weekly script service to radio stations last year, more than two-thirds of the stations requested that it be continued.

Slide 32. Last year we studied the use of spot announcements by television stations. During a three-week period, 17 stations used four spots a total of 261 times.

While we certainly are not satisfied with our ability to adequately measure the use of our information material by the media channels, we do have an indication of rather heavy usage. This, of course, is only part of the picture. We must next ask what influence this information has after it is used by the media.

Slide 33. In a 1961 study, Harold Guither interviewed 200 central and northern Illinois farmers who were leaving farming. He asked each farmer to list all the channels from which he got farm news. Here is a summary: magazines 95%; radio 45%; newspapers 34%; and television 26%.

Slide 34. In 1959 Phil Jones asked 100 farm operators in southern Illinois how they received information from the county extension farm adviser. These were the answers: newspaper stories 81%; information mailed direct 74%; visits to office 65%; bulletins 50%; meetings or tours 36%; and visits to farm 20%.

Slide 35. In an earlier study, 1954, Larry Sarbaugh of our office interviewed 200 farmers in Bond County, Illinois, regarding adoption of the soil-testing practice. He asked this question: 'If you wanted more information on soil testing, which of these sources of information would you trust most?' He then gave the farmers a list of possible sources, of which they could name more than one. Here are the results: farm magazines 65%; talking with others 64%; field meetings 44%; bulletins 28%; other meetings 15%; radio 12%; and newspapers 8%.

Slide 36. One of the most ambitious studies was conducted in 1951 by the Statistical Laboratory at Iowa State University. In this study 591 Iowa farm operators were personally interviewed and asked this question: 'In general, where do you get information to help you in farming?' These were the replies: farm papers and magazines 58%; talking to others 35%; radio 30%; and newspapers 26%.

Slide 37. In a 1954 Minnesota study, 110 Rice County farmers were asked where they got the most information on livestock and soil problems. The farmers gave these answers: magazines or newspapers 23%; bulletins 11%; neighbours or relatives 11%; ag. teachers 7%; and county agents 6%.

While these studies lack the refinement and sophistication that I urged in my remarks last night, they do demonstrate the consistent importance that farmers attach to information presented to them via the public media. Here again we are measuring the *status quo* of our current use of the various channels, and we are asking farmers for recall opinions. We must develop more precise measurement tools before we can expect to get the needed precise answers to our questions.

Now I would like to say just a word about our appraisal of the future. What changes do we anticipate in our communications programme? This is what we have said in our long-term plan of work:

1. In Illinois there is a trend toward fewer and larger but more specialized farms. We need to direct our information more specifically to these specialized farmers. This means increased emphasis on various direct-mail systems. We are currently in the process of providing each of our county extension offices with complete direct-mail equipment. This will permit advisers to distribute information materials prepared at the state office or materials originating in the counties.
2. Our use of television will expand, but we will base the selection of our programme material on the needs and interests of both farm and non-farm audiences.
3. We will use the press, radio, and television increasingly to accomplish the broad task of interpreting agriculture for the total audience.
4. We plan to step up our training of extension workers in the area of communications in order to improve their communication effectiveness.

5. We will also step up the preparation of aids and materials for direct use by county workers.
6. We intend to materially increase our emphasis on communications research and are considering establishing a continuing research panel of 1,000 Illinois farm families.
7. We will work toward the objective of making sure that future extension workers have had at least one undergraduate college course in agricultural communications. In this area it is significant that the Illinois Association of Vocational Agriculture Teachers at its June convention passed a resolution urging that a course in agricultural communications be required of all future vocational agriculture teachers.

I would now like to restate my request that during the remainder of this conference you give me the benefit of your appraisal of our use of mass media in Illinois.

SECTION VIII

Research in Supporting Disciplines and Extension Evaluation

LIST OF PAPERS

PAPER NO.

136. The Relation of the Assimilation of New Information to Increasing Age. *By* M. A. Jeeves.
137. Information-seeking Amongst Dairy Farmers. *By* H. A. Presser.
138. Contributions from other Disciplines to the Solution of Extension Problems. *By* Joan Tully.
139. The Mechanism of the Mass Communication Media in Agricultural Extension — The Current Rationale from the Behavioral Sciences. *By* J. P. Brien.
140. A Queensland Experiment in Rural Community Development. *By* J. R. M. Wolfe.
141. Research into the Decision-making Process. *By* Joan Tully.
142. Farmer Attitudes Towards Improved Management Practices and Extension Media. *By* W. O. McCarthy and D. J. Tugby.
143. Farm Decision-making and its Implications for Agricultural Extension. *By* K. O. Campbell.
144. Agricultural Economics and the Development of Extension Work in Australia. *By* A. H. Rowe.
145. Farm Management Analysis in Extension. *By* E. J. Waring.
146. A Contribution to Understanding Variations in Pasture Improvement Plans. *By* R. A. Pearse.
147. *Withdrawn.*
148. The Need for Scientific Research into Problems of Visual Communication. *By* D. A. Watson.
149. Evaluation Research in Extension. *By* H. A. Presser.
150. Fundamental Issues in Evaluating Extension. *By* J. P. Brien.
151. The Role of Agricultural and Pastoral Statistics in Extension Valuation. *By* J. A. Morrow.
152. Extension Evaluation in the Field. *By* K. M. Sillcock, K. E. Flynn, and D. J. Myers.

REVIEW

By K. O. CAMPBELL*

In my view, papers 136–152 do a very inadequate job of stating the case for the social sciences. Some important and highly relevant disciplines are not even represented. Quite a few of the contributors have made no real attempt to point out the relevance of what they have said to the specific problems of the extension worker. The papers present very mixed views as to the goals of agricultural extension. Some view its task simply in terms of achieving 100% adoption of a particular practice. Others view the advisory officer's role as one of problem-solving. Still others, like myself, feel that the ultimate role of the extension service should be to assist farmers to make decisions which are to their advantage.

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The paper by Jeeves (136) is very interesting, but I found myself wanting to know the critical ages when the changes in mental processes he described took place on average. In lectures and demonstrations such as extension workers are called upon to conduct, one usually finds that the audience is characterized by a very wide age distribution. What advice would Jeeves give as to the mode of presentation of material in such cases? Some of Jeeves' conclusions tie in very neatly with the specific findings of Fallding's studies. For instance, his observation that older subjects learn more efficiently when they can see the practical usefulness of what they are learning has relevance to the criticism of farmer groups that visiting speakers usually do not talk about the specific problems that confront them on their farms.

The papers by Presser (137) and McCarthy and Tugby (142) are the only representatives of the field of rural sociology. Both report research findings in a rather narrow area of enquiry. Presser is concerned with that part of the larger study he did in conjunction with Wilkening dealing with the farmers' sources of information. He still seems to be unduly surprised at the importance of inter-personal channels of communication. Perhaps the most interesting point that emerges from this paper is the fact that farmers apparently discriminate in seeking information between the knowledgeable farmer and the farmer able to impart knowledge. However I would doubt whether reciprocity is as important a factor in inter-personal communication as Presser claims. McCarthy and Tugby's paper (142) is stated to be a study of farmer attitudes to improved practices. Much of what is reported simply confirms the results of earlier studies, e.g. the fact that interests and experience beyond the farm tend to be characteristic of the better managers. Though I would agree that different types of farmers, such as the two types the authors discuss, probably need to be approached differently by the extension service, I am very uneasy about the way they envisage the role of extension. Why should it ever 'become necessary or expedient' in the present context of Australian agriculture for the agricultural adviser to concentrate on the 'no-hopers'?

There is one review (139) dealing with the broad field of communications research with particular reference to mass media. Brien makes the now common plea for a little money for social science research directed at the communication problem in agriculture to match the millions of pounds being expended currently on technical agricultural research. Unfortunately the author has not offered much guidance as to how the ideas and research findings he reports might be applied in extension work in this country. An allied paper by Watson (148) makes a case for research in visual communication. This is one area where I can see little justification for Australians to duplicate research which is proceeding overseas.

There are two papers dealing with community development, one by Wolfe (140) and one by Tully (138). Both are characterized by that religious-like fervour that one has come to associate with protagonists of the community development. By all means let us use group methods if they help to achieve the legitimate goals of agricultural extension, but I cannot see that the promotion of rural community welfare in its broadest sense represents proper use of the taxpayers' money by Departments of Agriculture.

There are some fundamental issues raised by the concept of community development as applied to agricultural extension. It seems to me to be too often assumed that communities of farmers always have common problems and that a common solution can be found for every member of the community. This may be true of a specific animal disease or of susceptibility to flooding, or of a social need such as a community hall. But it is patently not true of the more complex problems encountered in farm management. In these cases custom-built solutions are required. We should not espouse methods of extension which go counter to the real needs of the farmer. Another difficulty I find about the community development approach is the idea that, over a large range of problems, people in a community can pull themselves up by their own bootstraps. Fallding in his study of the Agricultural Bureau of New South Wales has drawn attention to the limitations of community groups in this regard. In technical matters, there is a need for professional guidance and assistance.

Morrow's paper (151) deals with the contribution of agricultural statistics to extension. I would agree with him that the extension officer can gain a lot of valuable background information from the study of the official statistics with respect to his region. But Morrow goes further and asserts that statistics provide criteria to assess research and extension requirements. This is not so. Figures showing the degree of adoption of farm practices are no criterion of the profitability of, or further scope for, the adoption of them on other farms.

There are three papers (149, 150, and 152) dealing with extension evaluation. The key to any sensible discussion of evaluation lies in the distinction made by Rheinwald between (a) everyday observation, (b) informal studies, and (c) formal research studies. I gather that practising extension workers consider that evaluations of the first two types are all that are required in most instances and that they do in fact have definite advantages over research studies, particularly if these studies take place a long time after the programme is initiated. I think that Brien (150) has summarized excellently the major pitfalls that beset the evaluator. He claims that formal evaluation is something of a luxury. I am inclined to think that evaluation tends on occasions to become a fetish among extension workers. As Sillcock *et al.* (152) suggest, it may even be inspired by political motives. Proper evaluation is impossible without a clear definition of extension objectives. As Presser (149) points out, if one takes a naive 'problem–recommendation–adoption' view of extension, evaluation becomes a simple task even if the results don't mean very much. If, on the other hand, one takes a more sophisticated, and I would submit a more realistic, view of the role of extension (such as that of influencing farmer decisions), evaluation becomes infinitely more difficult. In such cases

Presser's criteria of objectivity and quantification become almost impossible to achieve.

Papers 144 to 146 dealing with the contribution of agricultural economics to extension suggest that that contribution is of a dual nature. Both Rowe (144) and Waring (145) refer to growing acknowledgment of the need to combine economic with technical advice in extension work in this country and to the farmers' demand for such services. The implications of this development for extension training are also emphasized. As Rowe suggests, effective farm management extension does not stop at the profitability of farm practices, but must comprehend changes in farm organization and efficiency involving such questions as economies of scale and labour productivity. In this connection there must be continuing local economic research of the type described by Waring (145) and Pearse (146) to provide guideposts to extension officers in their work on individual farms. If agricultural economics makes no other contribution to extension, it serves to emphasize the essentiality of custom-made solutions to individual farm problems rather than blanket solutions and the need for an integrated rather than a piecemeal approach to any farm reorganization. Rowe has even put forward the heretical idea that rejection of extension recommendations by farmers may be an index of the success of an extension service. The second point about agricultural economics raised by Rowe is that the extension worker needs to consider the general economic climate in which rural industries find themselves at a given point in time. He paints a rather gloomy picture of the immediate prospects in this regard.

Finally, there are two papers, one by Tully (141) and one of mine (143) on farm decision-making. This is a relatively new development and essentially an inter-disciplinary approach to managerial problems. Tully is quite wrong when she says the Johnson-Haver approach has the profit motive as the key goal. There is no such restriction in their model. Different writers recognize different numbers of steps in decision-making, but the five stages — observation, analysis, decision, action, and acceptance of responsibility — usually are common to all systems. Contrary to what Tully implies, change is a continuing problem for the farmer and does not occur as a series of spasmodic events.

I believe that decision theory has a very important role to play in agricultural extension just as it has in other avenues of human endeavour. Even at the present stage of its development it raises some rather challenging and fundamental questions for extension workers including (1) whether farmers are being provided with the type of information they need for making intelligent decisions; (2) whether sufficient recognition is given to the fact that decision-making in agriculture takes place almost invariably in an atmosphere of change and uncertainty; and (3) whether the 'practice-oriented' extension advice traditionally given is ill-adapted to the needs of the progressive efficient farmers. These questions and other implications of the decision-making approach to management need to be thoroughly discussed at conferences such as this.

PAPER 136

THE RELATION OF THE ASSIMILATION OF NEW INFORMATION TO INCREASING AGE

By M. A. JEEVES*

Most, if not all, of the other papers grouped under the heading 'Research in Supporting Disciplines and Extension Evaluation' have concentrated our attention upon such topics as the results of sociological surveys, the importance of understanding group processes, the use of sociometry, mass communication, attitudes of farmers and agriculturalists, and the study of management problems. No-one would deny that all of these are concerned with problems of great importance and relevance to extension work. Having said this, I should like to focus your attention for a few moments upon another field of scientific endeavour which I believe has produced a considerable amount of relevant and useful information for the extension worker. I refer to the research findings of experimental psychologists as they help to understand basic psychological processes such as perceiving, thinking, learning, remembering, etc. To put the matter another way, I should like to argue that scattered among the psychological literature there are many findings which are relevant and important to a fuller understanding of what I shall call 'receptor characteristics'. I would at the same time readily concede that it is likely that factors such as conservatism of attitude, social context, and the like may well turn out to be the more important variables. This, however, does not absolve us from the consideration of other factors affecting basic psychological processes. It would seem that Professor Campbell, starting independently from a different viewpoint, has arrived at a similar conclusion for he writes (Paper 143):

> In a world where nothing is more certain than the certainty of change, it is important to place emphasis in all phases of education upon thought processes rather than on particularized subject matter. Anything that can be done to develop flexibility of mind, receptivity to new ideas, and skills in adjusting to changing circumstances should take precedence over detailed information about the prevailing practices of the day.

It is now necessary for me to substantiate my claim and I shall attempt to do this by focussing attention upon one characteristic of the 'receiver' which has received a lot of attention in terms of empirical research in the last twenty years, namely, aging. It seems to me arguable that a high proportion of farmers and agriculturists are getting on in years, i.e. forty to fifty or more years old, by the time they are in positions of authority sufficient to influence appreciably the acceptance or rejection of new ideas. This raises the question of whether this aging factor is likely to affect the ease and readiness with which new ideas will be assimilated, accepted, and put into practice. Moreover the answer we give to this question may suggest ways in which we can modify our extension strategy to make it more efficient.

Let us then concentrate on the receiver end of the communication process and the way in which one particular receiver characteristic, namely age, can and does affect (a) the capacity of an individual to assimilate new information and (b) the readiness of an individual to assimilate new information. Since both of

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these topics could more than occupy a short paper of this kind. I shall restrict myself almost exclusively to the first problem, i.e. of capacity, and only add a few comments in closing on the second problem of readiness.

For the purposes of exposition we can usefully break down the process of assimilation into a number of stages as follows:

1. reception of information (e.g. perception, coding, categorizing activity)
2. processing of information (e.g. thinking and manipulation of the evidence, making deductions and generalizations)
3. storage of information (e.g. short-term and long-term memory)

We shall consider each of these stages in turn and review the kinds of investigation which have so far been attempted in an effort to increase our understanding of each stage and we shall summarize the results so far obtained.

RECEPTION OF INFORMATION

Some aspects of this have received very detailed treatment elsewhere in the Conference under the heading of mass media. For this reason I shall draw attention only to studies specifically concerned with the aging factor. Some studies (7; 14) have focused attention upon the relation between increasing age and vocabulary size. They demonstrated that, while vocabulary size does not change in later life (see Fig. 1), there may nevertheless be a defect in thought arising from a lowering of verbal fluency and rate of association. This we may regard as a reduced

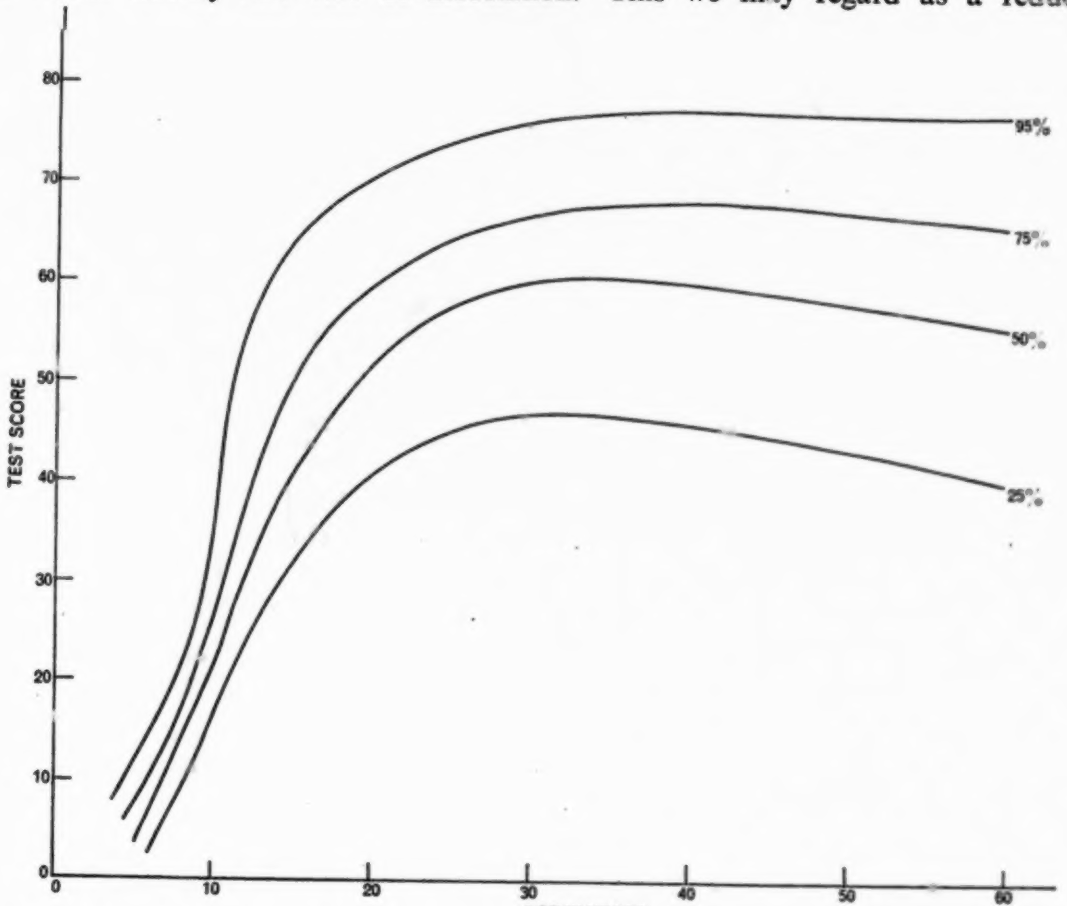

FIGURE 1: Age curves (vocabulary) for different percentile levels. (After Raven, 1948.)

efficiency in the speed of the coding mechanism essential as a first stage in the process of assimilation. The importance of this speed factor so intimately involved in the process of aging we shall meet many times and it cannot be overemphasized.

It is perhaps worth noting in passing that, while a considerable amount of experimental work has been carried out in an attempt to discover the most efficient medium for the presentation of the results of scientific investigation to readers of varying degrees of scientific sophistication (e.g. 8), yet very little attention has so far been paid to the possible influences of the process of aging upon such findings.

PROCESSING OF INFORMATION

The ability to make use of new information depends upon the individual's ability to manipulate it, to think about it, and to make justifiable deductions and generalizations from it. Again I note with interest that this problem is raised in a different way by Professor Campbell (Paper 143) when he writes:

> From the extension point of view, one of the most important findings stemming from recent empirical research concerns the extent to which farmers make use of deductive as opposed to inductive reasoning in solving the problems that confront them. Research reveals that though farms use both methods of reasoning they use deductive process much more than had previously been assumed . . . It is usually the younger, better-educated, more prosperous farmers with larger farms who are most disposed to use deductive thought processes including the figuring of costs and returns. . . . However, if one accepts the fact that farmers can and do reason deductively, the problem of the extension service becomes infinitely easier.

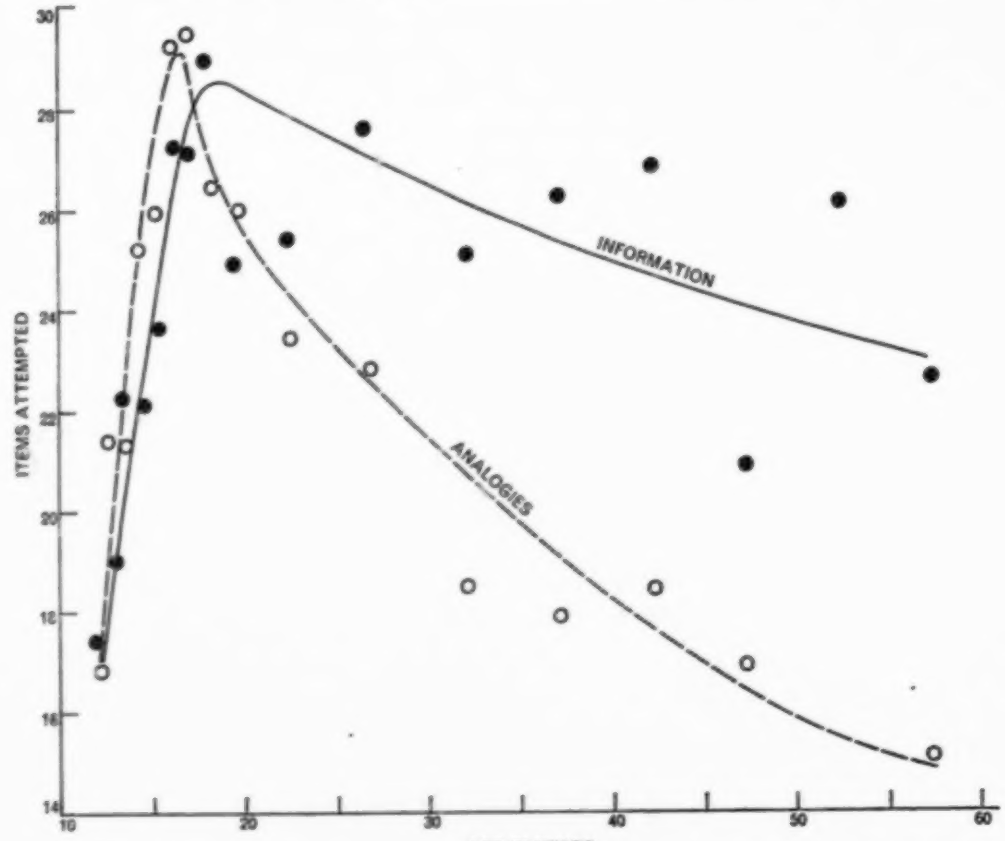

FIGURE 2: Age changes in items attempted in two contrasting tests. (After Jones, 1955.)

It has been shown by experiment (6) that older subjects were less accurate in doing a task requiring simple addition of digits than a comparable younger group as the *length* of the problems to be solved increased. It seems in fact that loss of speed of the elderly is a phenomenon basic to all mental processes and is intimately involved in the aging of the nervous system. Experimental tasks of increasing *complexity* (11) demonstrated that ability to cope with such problems declined with age. As against these findings are the results of studies by Raven (23) which showed that a person's capacity to *reason by analogy* and his ability to *recall information* do not develop at the same rate, mature at the same rate, remain constant for the same time, or decline at the same rate. (See also Figures 2 and 3, which give the results of a similar but later study (18).) Raven claimed that 'the reported findings have a direct bearing on all questions of normal and pathological changes in a person's capacity, as age advances, to acquire knowledge and recall information and thence on his continued happiness and well being in himself and as a member of the community'.

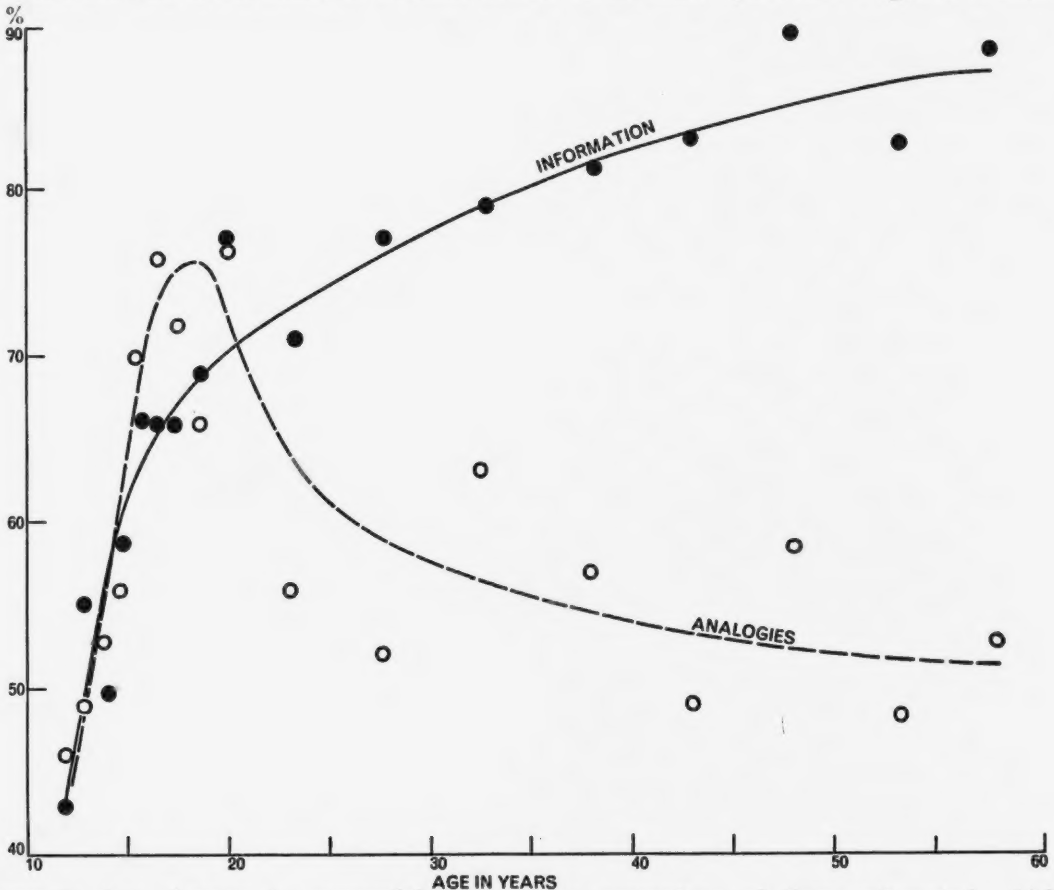

FIGURE 3: Age changes in successful answers, as percentage of those attempted. (After Jones, 1955.)

While one study (5) supported the common observation that there is less *flexibility* of thinking among older than younger people, it is clear from a study by Sward (26) that this is not a simple issue. Sward's results indicated that 'at least within the upper ranges of ability, an impairment of the "higher mental processes" is by no means an invariable concomitant of the years beyond sixty'.

TABLE 1

CLASSIFICATION OF SUBJECTS INTO THOSE WHO DREW DEDUCTIONS FROM AND THOSE WHO COMMENTED UPON THE MATERIAL

Set	Age range	Subjects who drew deductions	Subjects who made comments only
A	Under 35	10	6
	Over 35	1	9
B	Under 35	13	6
	Over 35	3	18
C	Under 35	25	4
	Over 35	13	15
D	Under 35	5	6
	Over 35	—	8

The older subjects showed a greater tendency to make comments instead of drawing deductions than did the younger. (From Welford, 1950.)

One further study, conducted by Allan (1), is worthy of comment since he investigated the effect of age changes upon ability to think logically (see Tables 1, 2, and 3). The clearest finding that emerged from Allan's results was that, although the older subjects seemed as capable as the younger of giving answers of some sort to the problems, they did so in different ways. In particular, the older subjects tended not to draw logical deductions based strictly on the statements as given, but to introduce supplementary premisses or to confine themselves to comments upon the statements given.

TABLE 2

RELATIONSHIPS BETWEEN AGE, DRAWING DEDUCTIONS FROM THE MATERIAL, AND OCCUPATIONAL GRADE, ALL FOUR SETS COMBINED

Occupational grade	Age range	No. in age range	Subjects who drew deductions	Subjects who made comments only
I	Under 35	35	26	9
	Over 35	18	8	10
II	Under 35	35	24	11
	Over 35	35	8	27
III	Under 35	5	1	4
	Over 35	14	1	13

The older subjects of each occupational grade showed a greater tendency to make comments instead of drawing deductions than did the younger subjects in the same grade. (From Welford, 1950.)

As will be seen from the results summarized in Tables 1, 2, and 3, the findings cannot be explained away in terms of occupational status since the effect holds up when this is partitioned out (Table 2). Neither can the differences between the under-35s and the over-35s be explained on the grounds that the older subjects were limited by the speed of their performance, since an examination of the total lengths of the productions of the two groups showed no significant difference (Table 3).

TABLE 3

NUMBERS OF WORDS IN ANSWERS

Set	Subjects under 35	Subjects over 35
A	209	184
B	147	198
C	102	94
D	190	197

The figures provided no evidence of a decrease in the length of answers by the subjects over 35. (From Welford, 1950.)

STORAGE OF INFORMATION

Learning Ability

Nearly all the studies which have been attempted with the object of understanding changes in learning ability with increasing age have reported a decline (see e.g. Fig. 4). These studies, which are surprisingly few in number, have used a wide variety of material. Welford (29) when summarizing this work said that 'there is a strong suggestion that impairment of ability to register new information in old

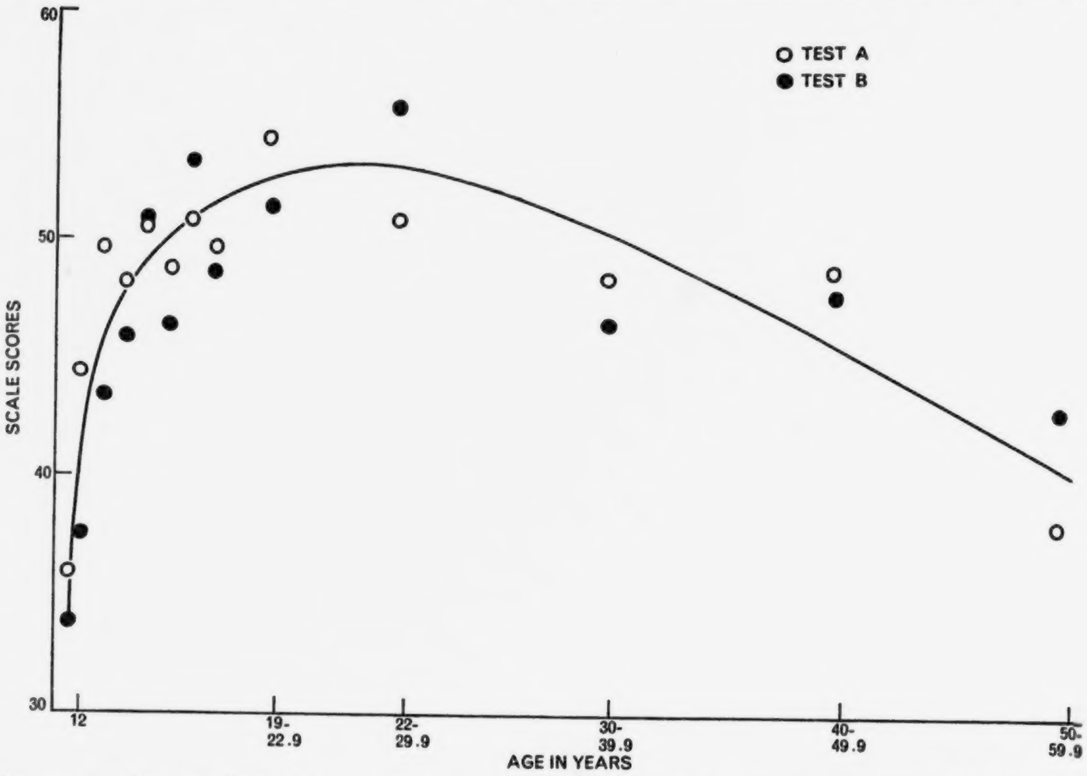

FIGURE 4: Age medians for two tests of immediate recall for motion pictures, based on the average and standard deviation for the age group 16–50. (After Jones *et al.*, 1928.)

age is to a great extent an artefact'. He pointed out that our everyday observation of older people at work strongly suggests that they often do not give themselves a proper chance to learn. At the same time there are at least four pieces of evidence suggesting that some things are learned at least as well by older people as by younger. Experiments (4; 25) suggest that, while older subjects may show up rather poorly when compared with younger subjects in laboratory experiments which make use of rather artificial material, they may nevertheless perform as well as the younger subjects when they are learning 'for use', i.e. with a clear and practical purpose in view. The results of other experiments (19; 27) support a similar finding and suggest that older subjects are capable of registering some new information about as quickly as younger subjects. Where the older subjects seem to compare most unfavourably with the younger is in the amount of new information which can be registered on any particular occasion. Thus, when faced with a new task, an older person may quickly acquire an imperfect idea of what he is required to do and subsequent apparent lack of ability to learn is due to the fact that this part-idea becomes difficult to modify.

Short-term Memory

As indicated above, the total process of assimilation may conveniently be broken down into a number of steps which must be gone through. After the first stage of perception and comprehension is passed, there is next a need for some form of short-term storage of the material for long enough to enable the processing stage to take place and to enable long-term retention processes to be completed. And it now seems highly likely that the observed learning deficit with age may be largely a result of a marked reduction in capacity for short-term memory in older people. Certainly as the amount of material to be learned increases, so the difficulty of learning among older people correspondingly increases. And it seems likely that this may be due to the fact that in any learning task where the amount to be learned is larger than the immediate memory span there is a need for frequent rehearsal and recall of small amounts as the task proceeds and this in turn interferes with the retention of the rest. This same factor is important in that, for full assimilation, the subject must hold enough information in short-term memory to obtain a conceptual 'framework' in which the processes referred to under 'Processing of Information' can be carried out.

'KNOWLEDGE OF RESULTS' AND ASSIMILATION

We shall consider now just one aspect of the problem of readiness to assimilate new information which has received a great deal of attention from experimental psychologists in recent years. From many laboratory studies it is now well established that 'knowledge of results' of action is a prerequisite of accurate performance. Furthermore, provided such knowledge is relevant, clear, and given within a short time after the action concerned has been completed, it is found to act as a powerful incentive (e.g. 2; 12; 15). It is also clear that ignorance of the results of action may well be the most important of all influences making for inflexibility in later middle age. With this in mind it has been suggested that a businessman tends to remain more flexible in middle and old age than a man in industry, and that the reason for the difference may lie in the nature and quality each obtains of the results of his actions and decisions. *If* the principles which are soundly based upon laboratory experimentation can be transferred to an industrial or commercial or agricultural extension services setting, they mean that the effects of actions and decisions which are readily recognizable will tend to weigh to a greater extent in shaping future actions and decisions than will more remote effects, even if these are recognized eventually.

Having raised the subject of flexibility as it is influenced by knowledge of results, I should like now to expand upon other aspects of flexibility and its relation to increasing age.

FLEXIBILITY AND INCREASING AGE

Lack of adaptability in later middle age is a problem which many industrial establishments have recently begun to take seriously. In the main the answers to two questions have been sought:

1. What are some of the possible reasons for the failure of older people to adapt?

and, arising out of this,

2. What, if anything, can we do about it?

It has, of course, been recognized for a long time that there are organic and emotional factors involved in the observed changes with increasing age. At the same time it has also seemed clear that the extent to which these factors take hold may be dependent upon environmental variables and it is these which are open to manipulation in any preventative programme.

I have already referred to the fall in performance in learning tasks with increasing age and this factor has to many seemed the obvious cause of increasing inflexibility in later years. However, more recent work has shown that such an explanation is over-simplified and only partially true. It seems, in fact, that older people *are* able to learn well given the right situation and that they are more affected by external conditions. Probably the most all-embracing factor is the need to give adequate time to the process of learning (9).

Let me now list some of the principal factors which have been implicated as possible causes of increasing inflexibility with increasing age. In such a short paper I can do little more than list and comment briefly upon each.

Work Load and Load Shedding

As a person grows older so his responsibilities and volume of work tend to grow. At the same time his speed of decision and performance tends to decline and this clearly leads to 'strain' unless the load is reduced in some way. Welford (30) has suggested that there seem to be three ways in which this may be done:

1. Accuracy may be sacrificed for speed.
2. In an attempt to simplify the task, attention becomes restricted to only certain aspects of the work.

3. Persons categorize and code new situations in terms of old ones. This, while reducing the load, carries with it inflexibility expressed as an unwillingness to change existing routines.

Rigidity as Measured by Mental Tests

A factor analysis (10) of the items of the Wesley Rigidity Inventory together with Raven's Progressive Matrices Test and age yielded three significant factors: one concerned with persistence and including such things as methodical behaviour and attention to detail; a second which suggested an opinionated yet limited person sticking to his own ways and beliefs, tending to generalize about others and to do one thing at a time (this factor was negatively correlated with intelligence); and a third which seemed to characterize the sort of person with a liking for established routine. It was the third factor alone which was closely associated with age; however, as Welford comments (30): 'One may well wonder, however, whether in real life the types of rigidity indicated by the first two factors are not associated with age to a greater extent than the test results suggest.'

Other Factors

There are a number of other factors (30) which are often regarded as being important, but about which the evidence is far from being unequivocal. These include:

1. Restriction of interest, which may result from the need for load shedding already mentioned or may simply be a carry-over into middle life of a strategy for achieving personal ambitions found necessary for success as a young man.
2. Stress, which if moderate may increase level of performance, but if severe will impair performance. Thus, for example, chronic and prolonged overwork and unduly heavy responsibility can in such circumstances lead to inflexibility.
3. Limitation or lack of fresh fields of endeavour and of new goals to reach may influence expectations for the future. There certainly seems to be a tonic effect which is experienced when there is something worthwhile to strive for; and without this, motivation soon lags and ultimately fails.

SUMMING UP ON ADAPTABILITY AND FLEXIBILITY

There are organic changes with age about which we can do little or nothing at present and which must be partly responsible for failure to adapt. However, the extent to which such factors are important depends upon environmental variables which are open to manipulation. While many reasons have been adduced for the failure to adapt in middle and later life, there are two which have been the object of a good deal of recent research. These are:

1. That difficulty occurs in the learning of new skills and mastering of new facts. The most recent research suggests that this is less serious than previously supposed.
2. The slowing of performance and of decision accompanying aging may give rise to attempts to 'lighten the load' by neglecting some aspects of the task or

situation, and this may manifest itself by reliance upon standardized and possibly inappropriate routines.

Theoretical Considerations

Although this is not the place to develop this in any detail, it may be noted in passing that two theoretical interpretations of these observed changes in learning with age have been summarized by Welford (29). He calls the first theory the maturation–degeneration theory since it leans heavily upon known biochemical or structural changes in the brain (31) and attributes much of the failure of older subjects to loss of ability to 'register' new information. The second theory he refers to as the experimental theory, which points out that when we confront a new task we inevitably do so in terms of experience and habits acquired in the past, and that these may or may not be appropriate and will help or hinder performance accordingly. This second theory further implies that the wide range of experience that older people possess and the greater extent of its channelling increase the chance of their bringing inappropriate experience to bear.

However, as Welford goes on to point out, there is a very strong case for the hypothesis that, as mentioned above, the crux of the whole matter may in fact lie in the decrement with age in short-term memory. This certainly is supported on the psychological side by measures of capacity for short-term storage; and on the physiological side the impairment of short-term retention carried by self-regenerating neuronal circuits would be expected from the known age changes in the brain that occur from young adulthood onwards, both anatomical changes (3; 22) and functional in terms of electroencephalograms (EEG) (20; 21). The psychological theory of Hebb (16) and the physiological and anatomical evidence of the smaller number of brain cells, the lowered general activity, and the tendency to disorganization of the EEG all suggest that the dynamic traces would be less viable, lasting for a shorter time and being less able to maintain their pattern while other activity is going on in the brain (29).

Some other Points of Contact with Psychological Research

It could doubtless be argued that almost any branch of contemporary psychology has some contact with and relevance to the efforts of the extension worker, but in many cases the relevance would, I suggest, be extremely tenuous and of little or no practical importance. There are, however, three areas of interest which I have not for reasons of space and time dealt with now, but which I believe could have considerable relevance, and these are.

1. Recent work on the study of thinking and particularly the work of Sir Frederic Bartlett as it concerns drawing conclusions by extrapolation from incomplete evidence.
2. The work of Festinger on what he calls 'cognitive dissonance', by which he refers to the psychological discomfort experienced when new ideas are introduced which appear inconsistent with existing ideas. Festinger suggests that when such dissonance is present, in addition to trying to reduce it, the person will actively

avoid situations and information which would be likely to increase dissonance. He has developed a Theory of Cognitive Dissonance (13) which is based upon numerous empirical studies, many of which seem very relevant to what is happening in the extension situation.

3. The work of Rokeach on 'The Open and Closed Mind' (24). While this is primarily a monograph reporting research on the nature of people's belief systems and the connections of these with underlying personality structures, at the same time it says some very cogent things about the characteristics of the closed mind and the open mind and I take it that the problem of the 'closed mind' is not an unfamiliar one to the extension worker.

SUMMING UP AND SOME PRACTICAL IMPLICATIONS

Failure to assimilate new information and to reproduce it subsequently may occur in (a) the initial reception and comprehension of the material, (b) the dynamic short-term memory on which the appropriate processing of the new material may largely depend and which must therefore bridge a gap of a few seconds or minutes until the more permanent changes of long-term memory occur, (c) the laying down and survival of a long-term trace, and (d) the recall of the material in situations where it is appropriate for re-use. Recent researches indicate that the third factor (c) is not very important.

Difficulties in (a) can be minimized by giving the recipient himself the control of the pace of instruction and assimilation — letting him, for example, learn as much from his own performance as from lectures or demonstrations. Perception can also be made easier and more efficient by endeavouring as far as possible to use existing coding mechanisms; in practice this means keeping the amount of new scientific jargon as small as possible and using existing categories whenever possible.

Difficulties in (b) may be avoided by setting a leisurely pace of learning by avoiding the imposition of time limits, and by tackling a small amount of new material at a time. Likewise, spacing practice periods with short periods of rest at frequent intervals should improve learning by older people.

Difficulties in (d) may be caused by subjects being unduly constrained by immediate associations when searching memory.

These difficulties frequently manifest themselves in later middle age in an increasing impression of inflexibility of thinking and action. The most promising line of approach to deal with this problem is not to tackle it directly by psychiatric or other similar techniques, but rather to examine carefully the conditions under which people are working in an attempt to find and modify the specific situations which encourage rigidity.

One way of minimizing the tendency to inflexibility in later middle age is to make more use of the known effects of 'knowledge of results'. All this adds up to the conclusion that older people *are* able to learn well, given the right situation and suitably chosen conditions. Taken in conjunction with the limiting time factor of short-term memory, it also means that every care should be taken to encourage older people to take all the time they need for the process of learning. It is perhaps ironical that many older people ignore this condition and will even attempt to assimilate in a few hours new information which would have taken them days or even weeks when they were younger. One further implication for extension work is that we must start at an early age with our attempts to 'sell' new ideas and this means directing efforts not so much at the farmers and pastoralists of today, but at those of tomorrow. With such young people we shall not only find more ready acceptance of new ideas, but produce a habit of *looking for* new ideas and this habit will stand a chance of continuing on into middle and later life when these same young people are in positions of responsibility.

A careful empirical study of the likely environmental variables, which, as is suggested above, are so important in the process of assimilation of new information, could be carried out using techniques already at our disposal and may be expected to make a significant contribution to the solution of both pure and applied problems in this field.

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Paper 139

THE MECHANISM OF THE MASS COMMUNICATION MEDIA IN AGRICULTURAL EXTENSION: THE CURRENT RATIONALE FROM THE BEHAVIORAL SCIENCES

By J. P. Brien*

'The role of primary producer organizations in Australia is of growing significance in extension work . . . They are becoming increasingly active in policy-making and in the administration of funds available from (their) levies. For our present purposes the significant thing is that pressure is mounting from these organizations to ensure that research findings are made available quickly and effectively to the rural community' (1). This statement neatly points to an enigma which, in the opinion of this author, agricultural extension in Australia must resolve: while professing that it aims at communicating the latest results of agricultural research, it remains open to the criticism that it is neglecting to consider other research which relates to its own operational procedures.

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Admittedly, several recent studies have explored the flow of agricultural research results in certain Australian farming communities (2; 3; 4). But it is often forgotten that there lies untapped a growing literature of research on communication made overseas during the past 30 years (5). Clearly, one paper at an extension conference cannot put the matter right. Moreover, in a brief sweep of so wide a subject, this paper will neither provide extension workers deeply interested in the social sciences with many new facts about communication, nor present them with a listing of better media techniques. It merely aims at showing what scientific research suggests is the way the mass media work in extension and indicating some pertinent directions in these studies to provide some new perspectives for Australian extension workers.

The Mass Media in Context

Extension methods are classified as individual, group, and mass contacts (6). The distinctive qualities of the mass media become apparent if we imagine a scale ranging upwards in audience size with examples of extension methods appropriately placed on it (7; 8).

Some of the features which become intensified through the communication levels are:

The audience per communicator becomes progressively larger

The nature of the message becomes less private or specialized and more public and non-technical

The range of difference between various messages becomes progressively narrower

Ready-made interest in the audience is less dependable, and purposeful interest-stimulation is necessary

The audience has less and less access to the communicator

Two advantages of the mass media compared with other extension methods are speed and economy, but, in its restrictive situation, purposeful use of the media clearly requires considerable skill. This and, especially, the deficiency in feedback — usually absent, delayed, or only inferentially obtainable — contrast sharply with face-to-face communication, often an extension service ideal. These factors probably account for the dissatisfaction that many extension workers feel when they use the mass media.

The Effects of the Mass Media

The mass media can influence such things as opinion, information levels, skills, and behaviour and we could expect that their effect could be long- or short-term, strong or weak, and manifest or latent (9; 10).

Twenty years ago, the mass media were thought to be attended by 'atomized' audiences, but it now seems that individuals perceive and respond to mass communications in terms of the influence other people have on them (11). From this concept, the well known two-step or multi-step theory of communications has been developed (12; 13; 14) in which the mass media are a first-class channel to opinion leaders (15; 16).

At the same time, it has been shown that most people expose themselves to those mass communications which are in accord with their existing attitudes or interests. Consciously or unconsciously, they avoid communications of the opposite hue. In the event of their being exposed to unsympathetic material, they often do not perceive it, or recast it, or forget it more readily than they forget sympathetic material. These self-protective processes or predispositions thus involve selective exposure, selective perception, and selective retention in most of the people reached by mass media (17). These sociological and psychological characteristics mean that sharp direct media effects are rare (18). The most common effect is precipitation of the audience in the direction it wants to go. Even advertising, it seems, does not sell goods to people who do not want to buy them; rather it steers the attention of those who were thinking about buying to a particular brand (19). To an extension worker, this implies that the mass media work best when their messages build on an existing attitude or can propel into action a latent impulse. Basically, the long-term effect of the mass media is a slow infiltration and colouring of an individual's world. Nevertheless, mass media reinforcement of the *status quo* is significant in itself and indeed, if it was otherwise, life would be impossible (20).

The newest approach to the study of effects by mass media researchers is on the lines that mediating factors (such as predisposition and personal influence) typically render the mass communications a contributory agent to some effect, and in those cases where they function in the service of change, the mediating factors are either inoperative or impelled towards the change (21).

The Process of Communication

Human communication requires at least three elements — a source, a message, and a destination. The process is simple: it involves a source with information encoding a message into signs and transmitting the message to a receiver who decodes the signs and interprets the data (22). Despite this simple portrayal, much can go wrong on the communication path. For a start, this chain system will have a maximum capacity for handling information dependent on the separate capacities of each unit in the chain. Thus, such a system can be no stronger than its weakest link. Another aspect is that the source can encode and the receiver decode only in terms of the experience each has had. The issue here is that messages are made up of signs which are signals for something experienced and, for communication to take place, these experiences must overlap.

The conditions needed for success in communication are:

1. The message must be designed and delivered so that it gains the attention of its intended audience.
2. The message must consist of signs derived from the overlapping experiences of sender and receiver 'to get the meaning across'.
3. The message must arouse personality needs in the receiver and imply ways in which they can be satisfied.
4. The message must suggest ways which fit in to the group situation to which the receiver is linked when he is moved to make the desired response.

The State of Mass Media Research

Some of the major developments in mass media research include:

1. A keener appreciation that the study of communication is a field, not the province of any one discipline (23; 24), and that each addition to knowledge must undergo evaluation (25).
2. The introduction of sophisticated mathematics such as the information theory model (26; 27). This is not a behavioral theory and its use has been limited in mass research so far. Nevertheless, through its quantitative measure on information, it brings statistics to the study of communication, and its macroscopic rather than microscopic approach helps clarify that there are problems common to all communication systems.
3. A trend towards the use of the scientific method, perhaps the most significant contributions being those from the social psychological communication research programme at Yale University. A well known example of this work is the 'sleeper effect' (28).

Certainly, there are still many gaps in our knowledge about communication, but it is equally true that there is no lack of vitality in communication research.

The Future — an Agricultural Extension in Australia

To this author, some agricultural extension workers in Australia view these investigations suspiciously, much as farmers did agricultural science studies say 30 years ago. Their suspicions may sometimes be validly based, but it is well to remember that these investigations will not be discontinued because we turn a blind eye to them. But more importantly, it is the thesis of this author that agricultural extension will never rank as a fully fledged profession until extension services take a deeper look at their own operational procedures. To this end, this conference may choose to consider appointing a body to continually survey relevant studies on communication in the supporting disciplines, and disseminate the information through such ways as a special agricultural extension journal. At a later stage, such a body may be in a position to sponsor, guide, and integrate a sound programme of communications research within Australia.

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PAPER 143

FARM DECISION-MAKING AND ITS IMPLICATIONS FOR AGRICULTURAL EXTENSION

By K. O. CAMPBELL*

In an age of jets and sputniks, it is sobering to reflect that one of the most significant, though less dramatized, developments of the past two decades has been the formal recognition of the importance of decision-making in various aspects of human endeavour ranging from defence strategy to business management. Many of the recent advances in statistics such as operations research and much of the effort which has gone into building bigger and faster electronic computers have stemmed from a desire to help men make better decisions.

The farmer in his decision-making capacity has not been neglected. The pioneering contributions of Johnson and Haver (1; 2) on the managerial role in farming have been tested, refined, and elaborated as the results of the ambitious Interstate Managerial Survey have become available (3; 7). Several publications (e.g. 4; 5; and 6) have stemmed from this study and this body of knowledge now forms an integral part of modern textbook expositions on farm management (e.g. 8). Rural sociologists have also become interested in the farmer as a decision-maker, largely as a consequence of their work on factors affecting the adoption of farm practices (9; 10). However, it would appear that the sociological approach to decision-making has very seriously neglected the degree to which farmers use statistical procedures, economic principles, and the technical disciplines in solving problems involving new practices.

These research developments have, I believe, important implications for extension workers. Within the compass of this paper, I can only discuss a few of them. In so doing, I am deeply conscious of the lack of any intensive study of the managerial behaviour of the species '*Agricola australiensis*', but, for present purposes, I think we can safely presume that commercial farmers in advanced countries will have many common traits.

Sources of Information

The most substantial change in the science of farm management since the war has been the recognition that management, for the most part, must be looked at in a dynamic rather than a static framework. The need for decision-making, which is the core of management, arises out of change and the associated uncertainty. In the absence of change the need for management would largely disappear. The changes to which farmers have to adjust themselves may be classified into five major types: (1) changes in prices and price relationships, (2) changes in production factors, (3) changes in technology, (4) changes in the personalities with whom they have to deal, and (5) changes in institutions such as governmental marketing arrangements.

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Before the farmer can make a decision, he usually has first to secure information relevant to the problem he has to solve. There may be situations where the farmer is forced into action before he has the information he needs and others where the farmer decides not to act without seeking further information, but the more usual situation is where the farmer indulges in a 'learning process' until such time as he has enough information to make a decision. Rarely, however, does he have perfect knowledge when he makes such a decision.

How adequately do the extension services serve the farmers' need for information when looked at from the decision-making point of view? The research I have already referred to suggests, as might be expected, that farmers do not normally rely on advisory officers to provide information covering all of the five areas mentioned. To what extent this situation is conditioned by what the extension services have normally provided in the past is hard to say.

But whatever has been the historic role of the extension service, it would seem that, in this country at least, extension workers could go a lot further in providing information tailored more to the farmers' requirements for decision-making. We should perhaps do more for the farmers as regards (1) the interpretation of market outlook and changing price relationships, (2) the provision of more specific information about the relation between inputs of various resources and likely output, and (3) the interpretation of major changes in agricultural policy. Even in the matter of new technology, which one normally regards as a major concern of extension workers, research suggests that farmers have difficulty getting the kind of information they want. From the extension service they mainly get information about existing technology rather than about new or emerging techniques. For the most part they get detailed information about new practices from commercial firms. Often a farmer needs information about new technology that is likely to be forthcoming and this is especially difficult to secure. For instance, a farmer with a serious weed problem might be unwise to invest heavily in an attempt to control the weed through cultural practices, if there were a strong possibility that an effective weedicide might shortly appear on the market.

One criticism which has been made of the rural sociologists' work on the adoption of farm practices is that they fail to appreciate the importance of the so-called non-communicative sources of information in the managerial process, i.e. those sources which can be used without contacting another person verbally or in writing. The better managers rely heavily on written records and past experience in coping with current problems. This suggests that more emphasis should be placed in extension work on record-keeping as a basis for improved management and relatively less on communication problems.

Decision-making under Uncertainty

The decision-maker in almost any environment is beset by uncertainties of one kind or another. But the farm operator experiences extraordinary difficulty from this standpoint. Yield uncertainties arising from weather and biological influences and uncertainties as regards prices at harvest time are but a few of the farmer's bugbears.

In the past, too much extension advice has been given as if farmers' expectations were single-valued, whereas in practice the typical farmer's problem is one of risk and probabilities. For instance, the wisdom of a decision to drench sheep or treat them for footrot depends to an important degree on the nature of the forthcoming season. To some extent, the major shortcoming here is on the research rather than the extension side. Even so it would seem that extension advice could be made realistic in terms of uncertainties confronting farmers. Rather than providing only the mean yield obtained in an experiment, the extension worker may need to provide the range and probabilities of different yields. The early work of Everist and Moule (11) and more lately of Dillon and Lloyd (12) has been aimed at providing Queensland graziers with probability information which will help them in deciding whether to sell their sheep at the onset of a drought or to feed them. Farmers in other situations where uncertainty is rampant could be given similar assistance in formulating appropriate strategies.

Analysis and Interpretation of Information by Farmers

From the extension point of view, one of the most important findings stemming from recent empirical research concerns the extent to which farmers make use of deductive as opposed to inductive reasoning in solving the problems that confront them. Research reveals that though farmers use both methods of reasoning they use deductive processes much more than had previously been assumed. The inductive process involves reasoning from a specific experience or observation to a generalization. A farm manager employing this method will study specific data with a view to making a prediction which will apply generally. A good example is the man who waits until most of his neighbours have 'tried and tested' a particular farm practice and then concludes it will be satisfactory on his farm. The deductive process, on the other hand, involves reasoning from a generalization or from a set of principles to the specific. For instance, it may involve the use of principles of economics, such as the balancing of marginal costs and returns, to derive judgments as to desirable courses of action. Farm budgeting is one specialized form of deduction.

It is usually the younger, better-educated, more prosperous farmers with larger farms who are most disposed to use deductive thought processes including the figuring of costs and returns. These same people turn out to be among the first to adopt new practices and also to be the sort of people who rely on scientists and extension workers more than farmers who are typically late in adopting new practices. All this suggests that the farmers most inclined to rely on technical advisers are being fed advice in a form ill-adapted to their needs.

In the past many extension programmes have been based on the assumption that farmers use inductive thought processes almost exclusively. Demonstration plots and experiment farms have been used to provide factual information about production practices. If the conditions prevailing on a specific farm are similar to those obtaining on the experiment farm, the operator of that farm might appropriately apply the practice demonstrated on his own farm. The weaknesses of this approach stem from the fact that no two farms have identical physical, economic, and managerial resources and on no privately owned farm can conditions on the experiment farms be duplicated. Given the resources available for public research and extension it is unlikely that it will ever be possible to provide all the data necessary to fit all conditions on all farms. However, if one accepts the fact that farmers can and do reason deductively, the problem of the extension service becomes infinitely easier. The task then is to provide the farmer not with isolated approved farm practices or bundles of practices which he can adopt by emulation, however ill-suited they may be to his immediate situation, but rather to provide him with the information he needs to work out the best plan for his own farm, taking into account his personal goals and the resources at his disposal.

Education for Management

There are many signs that Australian farmers are going to be faced with difficult problems of adjustment in the next decade. In this context, it is encouraging to see the progress being made in several States in providing more adequate farm management advice. But the provision of technical and economic advice is not sufficient in today's world. Farmers need to be taught managerial skills. As a recent United States report (13) on extension says:

> 'Making decisions for people is not one of Extension's responsibilities in management. Extension's proper role is a more limited and at the same time more difficult one—teaching people the process and principles of management and the use of the latest economic, social and technological information in practising it.'

In a world where nothing is more certain than the certainty of change, it is important to place emphasis in all phases of education upon thought processes rather than on particularized subject matter. Anything that can be done to develop flexibility of mind, receptivity to new ideas, and skills in adjusting to changing circumstances should take precedence over detailed information about the prevailing practices of the day.

Teaching improved management to a quarter of a million farmers is a challenging task. One of the disadvantages of the agricultural industry is that it is built up of myriads of small-scale operating units, the operators of which make independent managerial decisions with varying degrees of competence. If the challenge is great, so is the opportunity for improvement. In approaching the task of management education, extension workers would be well advised to take cognisance of the recent developments in management science as applied to agriculture.

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PAPER 144

AGRICULTURAL ECONOMICS AND THE DEVELOPMENT OF EXTENSION WORK IN AUSTRALIA

By A. H. Rowe*

The most significant and far-reaching change that has occurred during the last decade in the British and Western European agricultural extension services is the widespread introduction of an economic approach to technical advisory work. The marriage of economics and science in extension developed in the U.S.A. some 15 to 20 years earlier. The growth of the agricultural economics profession, the stimulus of the farm management club movement, and other signs collectively suggest that Australian extension services may now stand on the threshold of a similar development. This is not to suggest that an economic approach has not already become a feature of some State services.

An essential feature of this reorientation of technical advisory services is that extension personnel are given in-service training in those economic principles of direct application to their work, together with some elementary education in farm management appraisal and planning techniques. Although encouraged from the highest levels to approach their work in this more complicated and time-consuming manner, the rate at which it is introduced, tempered by personal knowledge of the needs of their respective areas, is left to individual discretion and inclination.

The basic reason for such radical change was the realization that, despite the constant outflow of new scientific knowledge, farm incomes were not improving commensurably.

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It is a natural corollary of scientific advance and application that farm cash outlays are raised, with a consequential increase in farmers' vulnerability to economic change. A further stimulus to the adoption of an economic approach occurs when farm incomes are under pressure from falling product prices and rising factor costs. The agricultural sector is particularly vulnerable to the effects of inflation upon factor costs, many of which, e.g. labour, fuel, fertilizers, etc., are relatively fixed and inescapable. This situation prevails today in Australia, but its effects were felt in more advanced industrial countries much earlier and led to a general demand for extension work to be more effective in helping farmers maintain their farm incomes. Some extension officers were already aware of this problem.

What is there about economics as a discipline that is of value to the extension worker? Economists are concerned with the study of human behaviour when problems of the utilization of resources which have alternative uses are involved under conditions of scarcity and uncertainty, assuming that it is desired to maximize the material welfare that can be obtained from the use of these scarce resources. This definition embraces both the causes and the effects of mankind's behaviour in the aggregate as well as the actions and reactions of individuals. Naturally, the extension officer is primarily concerned with individual farmers' attempts to maximize the welfare obtainable from the resources committed in their properties. In providing guidance in the choice of technique, it is surely essential for the professional adviser to know the basically simple economic principles which underly the actions of all those who seek to maximize profits or to minimize losses from the use of resources.

The main impact of economics upon agricultural extension is to ensure that technical innovation is profitably integrated on individual farms. It can provide a method of approach which is both critical and constructive in terms of its ultimate effect upon farm incomes. I am reminded of a NAAS officer in Kent who once told me: 'Before you fellows started pushing your economic approach my work was relatively easy. If a farmer asked for advice on a grass mixture for a 2-year ley I would give him one and think no more about it. Now, if I receive a similar request your economic training has taught me to ask many more questions, and before long I am wondering whether it wouldn't pay the farmer better to grow more wheat instead of grass. Almost before we realize it the farmer and I are embroiled in a budget. The consequence is that I am working harder, spending longer at each farm and visiting fewer, but it is most satisfying work and I believe that I am on better terms with farmers in my area.'

Further, it can provide extension personnel with a much-needed perspective on their own roles in moulding the future of our rural industries through a better understanding of the changing role of agriculture in Australia's trading economy. It is because economics is both an analytical and a coordinating science that it can provide such guidance to an extension service.

Let me deal with this second point first. Two leading Australian agricultural economists have ventured their opinions recently on the future problems that the rural industries will face and it is worth highlighting some of their impressions.

Mr. Gruen (1), for example, believes that there is a growing imbalance throughout the world between the growth in the production and consumption of farm products.

1. Since 1953, the level of international prices for primary products has declined by about 10%, but Australia's prices have dropped by more than 25%, with wool down by 35%.
2. Australian farm costs have risen by 30% in the same period. Real income per farmer has fallen by approximately 27%.
3. We must expect a downward trend in export prices to continue in the long run for, despite some advantages to be gained from the growing Japanese market, China's periodic famines, and random fluctuations in domestic markets overseas (e.g. U.S. beef), the strong factors which are weighed against us include:
    - *a.* rising productivity in world agriculture
    - *b.* the strengthening of agricultural protectionism in the northern hemisphere
    - *c.* Britain's entry into the Common Market
    - *d.* the substitution of synthetics for primary products
    - *e.* the slow realization of the potential demand in Asia, because of poverty
4. If we wish our farming community to enjoy a level of income comparable with that of urban wage-earners, we must concentrate our research and extension efforts upon raising the productivity of the rural work force, perhaps through an enlargement of the scale of production on individual farms.

Professor Lewis's paper (2) draws attention to the implications of economic progress for agriculture. 'The continuous forward pressure upon agricultural supply exerted by technology' and the tendency for supply growth to outstrip the increase in demand for farm products pose a continuous adjustment problem for agriculture in a developing economy. The adjustments called for involve the transfer out of agriculture of labour rendered redundant and simultaneous inputs of additional capital. If such resource transfers take place rapidly enough, factor rewards in agriculture approximate in parity those in non-rural occupations. But, as we know, those farmers who cannot produce profitably at current price levels do not transfer themselves and their resources into more profitable uses because of the existence of technical, economic, and social barriers to a smooth adjustment process.

Consequently, a chronic farm problem emerges, taking the form of depressed farm incomes and a fall-off in farm investment. The two components aggravate and perpetuate the situation by reducing both the opportunities and means of adjustment within the industry. This farm problem has emerged in the U.S.A. and in many Western European countries, and Professor Lewis is apprehensive that the particular features of Australian agriculture which appear to have retarded the emergence of a similar general farm problem here may no longer be able to withstand the pressure of these long-term conditions, which are apparently inherent in economic progress. It is suggested further that signs of growing maladjustments in the primary industries are 'all too discernible in many of our agricultural regions'.

What light does the broad outline of the situation presented by these two economists throw upon the future role of the extension officer in the field?

First, it appears most likely that the questions “Will it pay?’ and ‘How much will it pay?’ will be heard more frequently by the extension officer in the course of his daily work. At a field-day demonstration the officer can provide a general answer to such questions, but when asked on the farm they must be answered with reference to a particular farm situation. It is difficult to see how a satisfactory answer can be given without resort to a budgetary approach which considers alternative uses of resources and their probable financial consequences. How many extension officers feel confident of their ability to do their work in this way?

Is it not possible that the farming community itself will stimulate a change in extension emphasis as individuals struggle to survive in the strong tide of economic growth? In the U.S.A. today, extension workers are already being asked such questions as ‘How big or how specialized do I have to get to be an efficient producer and stay in farming at present price levels? Should I increase my scale of production or would it be better to concentrate more upon increased efficiency of my present production?’ (3). These may be strange questions to our ears, but I cannot help wondering if they are only just around the corner for both Australian agricultural economists and extension workers. The economist believes that his method of approach to a farm problem, together with his tool-kit of planning techniques and marginal analysis, enable him to answer such questions, but can the extension worker understand his answers well enough to intepret them to an individual farmer and help him integrate the necessary changes into his farming system? If he honestly believes that he cannot, then thought should be given to some in-service training at university departments where farm management research workers are located.

It may be necessary for an adviser to help an inefficient farmer understand his vulnerable position. The adviser may not suggest that a man should leave his farm, but should not be afraid to indicate the maximum level of reward he can expect if he stays. The final decision is the farmer's — the extension officer can only present the facts as they are known at the time. Thus an extension service is not a medium for enforcing agricultural adjustment, but it can serve a useful function in effectively demonstrating the need for adjustment in individual cases and the possible consequences if these adjustments are not made. If the farmer is willing to become more efficient the extension officer cannot turn his back on him. But to help the farmer to the best of his ability, the adviser will need further training in methods of farm planning wherein his technical and economic knowledge can be coordinated.

Secondly, attention has been drawn to the need to raise labour productivity. Of course, raising OUTPUT is the easiest way to raise productivity per head, but perhaps more emphasis could be given to management practices which reduce LABOUR AND MACHINERY COSTS? B.A.E. and other farm surveys have shown that, in many types of agricultural production, ‘labour and power and machinery’ items combined (including unpaid family labour, depreciation, repairs, contract work, fuel and power, etc.) absorb 50% and more of the total costs of production. By comparison, materials and services are much less important in farm cost structures. On many farms, machinery purchased merely makes work easier for the labour available (timeliness of work apart), but its real economic potential is not realized unless it releases labour for other work on the farm which would not otherwise be done, *or* it renders someone redundant. Generally, it is not purchased with a potential release of labour resources in the mind of the farmer. Perhaps farm management adjustments can be investigated which would have the effect of releasing some unpaid family labour for either full-time or part-time labour away from the farm to add a cash income to farm finances. Unfortunately, in many areas the scope for this important cost-reduction adjustment is severely limited by distance from town and restricted job opportunities there.

Thirdly, the fundamental purpose of providing advice to the farmer is to assist him to run his farm as a successful business enterprise. But to do this effectively in practice, the adviser immediately becomes concerned with individual farmers' basic motives for farming and their educational and family background, for these together affect the way they run their businesses. The fact that the farm is also a family home means that farm and family decisions are inextricably linked and that some of the reasons why farmers do not put new ideas into practice are bound up with this complex. An economic approach helps us recognize the primary need for an extension officer to assist the producer to IDENTIFY and to ACHIEVE his economic and social objectives (4). From this viewpoint it might be easier to reject the idea that if new techniques and scientific knowledge are not as readily applied as some people would like to see then extension has failed. If extension work is fundamentally educational, then the farmer's ability to evaluate and reject advice must be expected to grow and mass acceptance to decline. But this surely is a sign of the success of extension rather than of its failure?

Other speakers dealing with specific economic research techniques have indicated some of the ways in which economic analysis can provide guidance both to the extension worker and to the farmer. Agricultural economists have a particular responsibility to disseminate these methods and their results as widely as possible throughout the extension services.

I have concentrated my attention upon the probable economic conditions under which the primary industries will contribute to the growth of the Australian economy, and the orientation which this knowledge suggests for future extension work in Australia.

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PAPER 150

FUNDAMENTAL ISSUES IN EVALUATING EXTENSION

By J. P. BRIEN*

Evaluation involves collecting information about some activity and using the data as a base for making decisions, forming judgments, and drawing conclusions about the activity. Most of us continually try to evaluate what we do and, axiomatically, extension workers have engaged in this process in some form or other since extension services began. But extension evaluation aside, few will deny that we can often be misled by the casual evaluations we make because of basic errors in our observations or collection of information and/or errors in our interpretation of the data.

In Australia in recent years, some attention has been given to the problems of extension evaluation as a special study (1) or in discussions among extension workers on the possibilities of sharpening the process so that extension administrators can gauge progress and develop services more effectively (2).

This paper aims at bringing together some thoughts on the basic issues in extension evaluation. Experience here and overseas suggests that evaluations are often called for in any type of educational process (3) and, while there are no simple techniques for reaching evaluation conclusions in which we have absolute confidence, efforts made in this direction suggest the clarifications needed to improve the job of evaluating agricultural extension. Let us mention some of them:

1. What is Success in an Extension Programme? Evaluation requires the consideration of change in a standard, goal, or objective. The United States approach, for example, is that 'the function of the Cooperative Extension Service is . . . to aid in diffusing among the people . . . useful and practical information on subjects relating to agriculture and home economics and to encourage the application of same . . .' (4) or that '. . . extension is a partnership between the government, the land grant colleges, and the people which provides service and education designed to meet the needs of people. Its fundamental objective is the development of the people' (5). These statements imply a series of goals, multidimensional and interrelated, and much more complex than just the simple adoption of farm practices.

2. The Post Hoc Ergo Propter Hoc *Fallacy.* Even where it is possible to select a narrow situation where an extension goal or goals can be specified and a change in them measured, it is not sufficient to attribute a change, if it occurs, merely to the extension services' effort, because human behaviour is affected by many factors and extension may be only one of many which directly or indirectly push people in the same direction. Special efforts must often be made to eliminate the effects of these other factors to highlight the extension effect exactly. This issue is also a central difficulty in other social investigations, for example, the study of the effectiveness of an advertising campaign.

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* Victorian Department of Agriculture.

3. The Time Dimension. Some decision must always be made on the time span of the process. We agree that the diffusion of information from an extension service takes time, but perhaps it is longer than we often think. For example, American rural sociology studies on hybrid corn adoption show that majority adoption took about 12 years (6). There may be other cases where the adoption rate is quicker, but rarely can we ever predict, in the first instance, the actual rate of adoption. Should the evaluation process then be thought of in terms of five years, ten years, or a generation?

4. Differences Among Goals. Innovations can be classified according to the changes they involve in the amount of human effort, capital and physical materials, manipulative skills, and management ability required for achieving maximum benefits (7). It is possible to construct a gradient of innovations ranging from the simple, where farmers need little motivation to adopt, to the complex, where high motivation is needed before acceptance. Evaluation must thus take into account that different degrees of extension effort are required to get acceptance of different innovations.

5. Survey or Experiment? Extension information directed at changing farmers is not simply pushed into the service at one end and out at farmers at the other. Basic information is moulded within the service to suit farmers' needs and sent to them through different communication channels. Thus, a survey to measure change at the farmers' end may not be sufficient for the administrator, because he may want to know what decisions at what points in the service influenced the final change in direction and/or intensity. This requires an experiment, but is difficult because of problems involved in constructing measuring instruments and isolating variables (8) for a statistical design.

Extension evaluation work has expanded rapidly in the United States in recent years and there are now evaluation personnel on most of the State extension staffs (Raudabaugh, personal communication). Stimulated by conferences, training programmes, and publications (9) sponsored by the Division of Extension Research and Training, U.S.D.A., more evaluation projects are under way than ever before, but, probably for the adequate reason that State extension administrators view project results as solely their concern, reports on completed evaluation studies are not easy to obtain. One example of an evaluation study made on farm and home development* in Wisconsin by rural sociologists was recently released (10). The findings cover a five-year study of this intensive extension programme and were based on an experimental design in which participating families were matched and compared with non-participating or 'control' families. The evaluation was based on differences between the two groups in their degree of contact with extension staff and in changes in selected social and economic variables over the

* A recent development in the Cooperative Extension Service in the U.S.A. in which, basically, detailed managerial advice is offered to a limited clientele of farm families.

five-year period. The report is valuable not only because of its study design, but also because of the authors' discussions on problems of extension evaluation.

Compared with the situation in the United States, the evaluation of agricultural extension in Europe is of much more recent origin. The Organization for European Economic Cooperation conference on agricultural advisory services held at the Hague in 1953 first drew attention for the need for devising a system for the evaluation of European advisory work and of particular methods and aids. Two years later, the European Productivity Agency launched its evaluation programme and appointed two consultants to hold seminars and design projects with agricultural advisors in member countries. By 1959, 31 studies had been undertaken in 13 member countries (11). One early study in Europe was on the evaluation of agricultural advisory methods used in Norway to promote soil testing (12). While not delineating much about each method, the study nevertheless shows a careful situational analysis and would provide a bench-mark for later projects.

The European approach to evaluation of agricultural extension has been summed up this way (13):

1. there are three degrees of intensity in evaluation: everyday observations; informal (do it yourself) studies; formal (research) studies
2. formal studies are too difficult for agricultural advisers in the field and must be left to central offices of the extension services or scientific institutes
3. even consciously made 'everyday observations' are not always sufficiently precise
4. informal studies are suitable for advisers in the field, though advisers who do them successfully will need training in such things as questionnaire construction and sampling techniques, and evaluation projects will add to their already heavy work load

Now let us turn back to the Australian scene. Even if agricultural extension services in Australia were fully developed in organization, adequately staffed with trained and experienced personnel, well provided for financially, and so on, then in the opinion of this author the extension service could still only make the very modest beginning in the field of formal evaluation in immediate years. By its very nature an accurate, worthwhile evaluation of extension on a national, State, or even regional basis is out of the question within the foreseeable future.

Technically, it is possible for the extension service to evaluate its progress in a 'narrow' situation — narrow in such terms as size of audience and simplicity of goal. But here again, it is an administrative question whether, at this stage of development in Australia, the service can afford the staff and money required for evaluation. If it can, then it would seem wise to head in the direction of the European-type informal studies, where field extension workers can be trained in a survey technique, attitude formation and measurement, interviewing, sampling, data processing and tabulating, and so on. They can then, theoretically, make better evaluations of extension effect within their own districts. But if the extension service cannot devote staff and money for evaluation, let us concern ourselves for the present with solving extension's other problems.

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SECTION IX

Developing a Profession of Agricultural Extension

LIST OF PAPERS

PAPER NO.

153. Post-graduate Course in Extension Educaton. *By* Joan Tully.
154. Extension as a University Discipline. *By* A. H. Hughes.
155. Agricultural Extension at the Oklahoma State University. *By* P. J. Skerman.
156. The Agricultural Science Writer. *By* W. F. Ritchie.

156*a*. Professional Training of Extension Officers in the Territory of Papua and New Guinea. *By* S. P. Saville.

157. Training in Extension Service Methods (New South Wales). *By* H. Parry Brown.
158. In-service Training. *By* H. R. Dickinson.
159. Training of Extension Workers. *By* J. A. Morrow and H. C. H. Watson.
160. In-service Training of District Agronomists. *By* G. Nicholson.
161. Professional Extension Training. In-service Training of Livestock Officers (Sheep and Wool). *By* C. J. Hawkins.
162. Personnel Management Methods in the Selection of Extension Officers. *By* G. A. P. Hunt.
163. Defining the Objectives of Agricultural Extension — the Effects on Training and Responsibilities of Individual Extension Officers. *By* J. C. Avery.
164. Factors in the Effective Training of Foreign Students in Extension Organization and Methods. *By* C. W. Winders.
165. Training in Primary Industries Involving Government Organizations by Students Sponsored Under International Aid Schemes. *By* M. J. Quinlivan.

REVIEW

By C. A. HOLLAND*

The papers grouped under the heading of 'Developing a Profession of Agricultural Extension' cover the fields of professional extension training in relation to universities, agricultural colleges, in-service training, and international aid.

We have just had the pleasure of listening to Dr. Joan Tully (153) reviewing current methods of extension and drawing conclusions from past experience. She has stressed the need for training in associated sciences and outlined the provisional one-year postgraduate diploma course in Extension Education to be available at the University of Queensland.

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Paper 162 by G. A. P. Hunt suggests the need for reviewing methods at present in use by some when selecting officers for extension work. The paper examines the nature of the work of an extension officer and the type of man required to carry it out. It warns of the danger of placing too much importance on academic training and overlooking essential attributes.

This leads us to consider desirable attributes and subsequent training for a successful extension worker. In this connection, paper 155 by P. J. Skerman brings out some valuable information from U.S.A. The first part of the paper deals with in-service training facilities at the Oklahoma State University, which must have been read by many of us with comparative envy. The second part refers to Warren's work on the background training of extension workers who, after subsequent experience in the field, were classified as 'successful' and 'unsuccessful' workers. A close study of Tables 1 and 2 in this paper is of particular interest in connection with syllabus details outlined by Dr. Joan Tully a little earlier. It is pointed out that Warren's study showed that significant differences were shown in 'success' where training had been received in subjects beyond technical agriculture.

I suggest that now we direct our attention to the objectives of agricultural extension to give us a clearer picture of the relationship between agricultural academic knowledge and education techniques. Many papers touch on this point, but I have selected paper 163 by J. C. Avery as a focal point. The author discusses the definitions of agricultural extension as published in the first report of the A.I.A.S. Subcommittee. He then examines factors in the individual extension officer's activities and relates these to the definitions. He concludes by suggesting an alternative definition. The Subcommittee's definitions of agricultural extension are given under two headings:

1. 'To communicate to the farmer . . .'
2. 'Through the education process, to . . .'

This stresses the difference between 'communicating' and 'educating'.

Mr. Avery, in dealing with 'Demands of the Rural Community', refers to the importance of technical knowledge. Other papers also stress that sound basic education in agricultural science is an essential whether we are merely 'communicating' or really 'educating'. Some indicate that there are additional needs. Others do not stress this point.

We now come to a group of papers (156*a* to 161 incl.) which deals with in-service training as applied to various branches of agriculture in different parts of the Commonwealth. I suggest that we examine these from the angle of whether this training places emphasis on technical matters or on extension techniques.

Taking them in order of publication, let us first look at Papua and New Guinea as presented by S. P. Saville (156*a*). We note here that there are specialized problems associated with work in an under-developed country. Stress is laid on the need for training in anthropolgy and sociology. The development of an agricultural college in New Britain suggests future opportunities for the training of extension workers. In the meantime, it appears that specialized training outside the Territory is mainly of a technical and administrative nature.

Training facilities in New South Wales — as detailed by H. Parry Brown (157) relate entirely to training in extension service methods. It is of interest to note here that these training facilities are extended to two universities and an agricultural college. It is of special interest to note the value placed on these courses by the New South Wales Public Service Board in relation to non-graduate field officers.

Turning our thoughts to soil conservation, H. R. Dickinson (158) draws attention to specialized training found necessary in this field of work. Whether the officer is a graduate or diplomate he first needs technical training in subjects not covered in agricultural courses at universities and colleges. In-service training is, therefore, designed to cover both technical subjects and extension methods, but it appears that, in view of the time available, the former must receive the greater emphasis.

The paper detailing the training of extension workers within the Victorian Department of Agriculture submitted by J. A. Morrow and H. C. H. Watson (159) sets out clearly the various types of in-service training provided for officers of varying academic standards engaged in varying aspects of extension. Here the stress is laid on the training in technical matters, some attention being given to extension methods, this mainly in association with the use of mass media. On the last page the authors express a considered opinion that, at the undergraduate level, intensive courses in the disciplines associated with extension work would result in a lowering in the standard of technical knowledge now being provided. They suggest as an alternative that special postgraduate courses could be devised for the future extension worker. This is of special interest in relation to the paper just read by Dr. Joan Tully.

In considering the paper submitted by G. Nicholson (160) on in-service training of district agronomists in the New South Wales Department of Agriculture, it should be borne in mind that this should be studied in relation to the paper by H. Parry Brown (157) previously mentioned. The training described in paper 160 is, therefore, supported by training in extension methods. This paper shows the wide field of activities embraced by these officers and the various types of in-service training required to fit them for this work.

The last paper covering in-service training (161) comes from C. J. Hawkins, of New South Wales, on the training of livestock officers (sheep and wool). Here again we must consider it in relation to the paper by H. Parry Brown. Mr. Hawkins deals with the special requirements of technical training for sheep and wool officers in relation to their previous experience.

Generally reviewing this group of papers relating to in-service training within Australia, we might attempt to draw a conclusion that the majority of in-service training is concentrated on technical matters rather than extension techniques. In considering them we must bear in mind that seven different authors have submitted information relating to two States and one Territory. If, therefore, we are endeavouring to obtain a picture of in-service training facilities throughout Australia and New Zealand, we must gather the basic information from the first eleven papers.

The need for training in extension work is brought out in the opening sentence of the paper submitted by A. H. Hughes of Massey College, New Zealand (154): 'In the past, extension workers in New Zealand, and it is understood Australia, have learned their job by doing it.' He later points out that learning by 'doing' cannot be entirely replaced by university training. He further points out that extension workers straight from college cannot be expected to become 'old and trusted farm advisers', but after their basic training must learn to relate principle to practice. The author then details the material embraced in the optional subject 'Agricultural Extension' which can be taken in the final year of the four-year degree course at Massey College.

Attention is directed to the need for training in a field of vital importance in agricultural extension in the paper on 'The Agricultural Science Writer' by W. F. Ritchie (156). The author stresses the need for men trained in both agricultural science and journalism. He points out many reasons why such a field does not attract agricultural science graduates. His suggested solution for overcoming these difficulties is by the provision of bursaries such as are available for many forms of postgraduate study.

Now we turn our attention to the assistance that we are called upon to give from time to time in the training of foreign students in extension organization and methods. I refer to the paper of C. W. Winders (164). He points out that most technical agriculturists who come to Australia as trainees are concerned primarily with subject matter. An appreciation of this can be obtained by a study of Appendix B to the information supplied by M. J. Quinlivan (165). Mr. Winders stresses the importance of tailoring the training of foreign students to their qualifications and needs, the latter being often difficult to determine. It is clear from the detail given that efficient handling of such training is in itself a specialized task.

These papers have brought many questions to our minds and I have no doubt that many of us would like to hear the views of others on such questions as:

1. Is the future of agricultural extension work to be restricted, if undergraduates and graduates have their training confined to technical subject matter?
2. If associated sciences are to be taught, should these form part of an agricultural science course or should they be subjects for postgraduate study?
3. What can we do about facilities for training agricultural science writers?

SOME ESSENTIAL ELEMENTS IN THE DEVELOPMENT OF AN EFFECTIVE EXTENSION SERVICE

By A. H. MAUNDER*

It is indeed a privilege to participate in this Australia-wide extension conference. I am very grateful to the Committee for inviting me to attend.

The convening of this conference is surely a very timely and progressive step in the economic and social development of this great country. The prepared papers indicate a growing body of experience and realization of problems as well as indicating the present and potential contribution of extension education to Australian agricultural development. In my opinion, this conference is convened at the right time and is bringing together the right people. It should have a profound influence on future operations and programmes in the extension education field.

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In reviewing materials in preparation for this conference, I came across a leaflet prepared for the guidance of African agricultural instructors in Nyasaland. Although a very simple and straightforward document on the whole, it opened with this subtle quotation:

> Teach not thy parent's mother to extract
> The embryo juices of the bird by suction,
> The good old lady can that feat enact
> Quite irrespective of thy kind instruction.

Put in simple language it merely says, 'Don't try to teach your grandmother how to suck eggs. She can do it without your help.' I'm inclined to feel the same about my part in this conference. What useful ideas can I bring to such an elite group of educators as are assembled here? However, I learned long ago that it is through a pooling of ideas and experience that problems are solved and progress is achieved. I expect to learn a great deal from this conference as well as to share with you my own experience as an extension educationalist.

This evening I would like to share with you some thoughts on three aspects of extension work. I have seen few references to these aspects in the conference agenda. These three aspects are:

1. The basic purposes of an extension service
2. The scope of extension responsibility
3. In-service training of extension officers

BASIC PURPOSES OR OBJECTIVES OF EXTENSION WORK

In 1950, Mr. Penders and I participated in a study of advisory services in 14 European countries. Representatives of these countries met in Paris to outline elements and factors to be considered. The first item on the list was 'Basic Objective of the Advisory Service' (in country being studied). The representative of the United Kingdom asked, 'Why have a question to which the answer is so obvious? The object of an advisory service is to increase the volume and quality of production.' Our team members did not entirely agree with the U.K. representative and this item remained in the outline. Before the study was completed, we concluded that there are many other and perhaps more important objects of extension or advisory work than increasing the volume and quality of production. This objective was indeed of vital importance in England during and following World War II. It is NOT the most important objective in the United States in 1962, when we are saddled with surplusses of cotton, corn, wheat, butter, and many other commodities.

Many groups of extension officers from other countries come to the United States each year to study extension education concepts and methods. I have questioned hundreds of these participants as to their concept of the purpose of extension work. The following are among the answers commonly given:

To bridge the gap between research and its application on farms
To increase agricultural production
To increase farm income
To improve the volume, quality, and efficiency of agricultural production
To implement the economic policy of the Government
To teach improved agricultural practices
To raise standards of living

Extension education contributes to all of these objectives, but none of them is the complete or exclusive function of an extension service as I see it. In my opinion, and in the opinion of most students of the extension movement, the central purpose of an extension service relates to people. Its purpose is to change or improve through educational means the ability of people to use knowledge from whatever source in attaining goals they set for themselves, taking into account the general welfare of the society of which they are a part. In achieving this purpose, however, extension is likely to also achieve the other purposes previously mentioned. Put in a nutshell, extension services, to be effective, must centre their attention on the wants and needs of people — people as individuals and as groups forming a society. If the central objective is Government policy or material production or soil or plants, it loses its appeal to people.

SCOPE OF EXTENSION WORK

The Smith–Lever Act, establishing the Cooperative Extension Service in the United States in 1914, gave as its purpose:

> . . . to aid in diffusing among the people of the United States useful and practical information on subjects pertaining to agriculture and home economics and to encourage the application of the same . . .

Considering the fact that this purpose was enunciated more than 48 years ago, it is a very profound statement. It clearly identifies extension's function as educational. Not education in the abstract, but education for action. It is education directed to helping people solve practical day-to-day problems which they encounter in farming and living. The Smith–Lever Act did not specify that extension was only for farmers. It was for people generally, but in subjects related to agriculture and home economics.

Since the Cooperative Extension Service was charged with assisting people in solving problems, its scope of responsibility has broadened through the years. In the beginning, efficient agricultural production, the feeding and clothing of the family, and the training of children were the central themes. Programmes were simple arrangements of demonstrations and the organization of adult and youth groups to carry on educational activities. But, through the years, the problems of agriculture and of rural life became more complex. Declining prices of farm products, increasing costs of production, the great depression of the 1930s with its resultant planned economy, two world wars, decline in percentage of rural population, and many other factors complicated the situation of the farm family.

The Cooperative Extension Service has found it necessary to redefine its function and scope periodically. The first major redefinition took place in 1948, when a representative group of extension administrators, farm leaders, Government officials, farm editors, and others reviewed the history and accomplishment of the service, analyzed the changing situation, and produced the so-called Kepner Report. This report brought the philosophy and purposes of the Smith–Lever Act up to date. It gave more emphasis to economic problems including farm management and marketing. Again, in 1958, the Extension Committee on Organization and Policy of the American Association of Land-Grant Colleges and Universities appointed a committee to make a thorough study of the scope of responsibility of extension services and produced what is known as the Scope Report. This report provides policy guidance to State Extension Administrators and programme committees. The Scope Report delineates nine major areas of programme emphasis:

1. Efficiency in agricultural production
2. Efficiency in marketing, distribution, and utilization
3. Conservation, development, and use of natural resources
4. Management on the farm and in the home
5. Family living
6. Youth development
7. Leadership development
8. Community improvement and resource development
9. Public affairs

The Scope Report also described and defined the clientele of the extension service as:

Farm families
Non-farm rural residents
Urban residents
Farm, commodity, and related organizations
Individuals, firms, and organizations which purchase, process, and distribute farm produce and which provide farm people with essential services and supplies such as credit, fertilizers, feed, and many others.

This Scope Report, modified State by State and considered county by county, clearly enunciates the scope of the extension service. It provides a framework for programme planning. It has also proved useful in informing the public, including legislators, as to the purposes for which their tax funds are spent.

In my opinion, a charter such as is provided by the Smith–Lever Act in the United States and a statement of purpose and scope such as I have just described form the foundation for effective programme development, coordination of effort, and for public confidence in the service.

IN-SERVICE TRAINING OF EXTENSION WORKERS

Several papers prepared for this conference have mentioned rather briefly the training provided for extension workers in the various States. The authors recognize:

1. The need for training in basic and applied agricultural science.

2. Training in concepts and methods of extension teaching.
3. The need for keeping extension workers up-to-date with respect to advancements in agricultural science and related economic and social phenomena.

I have the impression that pre-service training of extension workers in Australia has been limited mainly to theoretical and practical training in agricultural science; that in-service training has centred largely upon keeping the staff informed on the latest scientific developments; and that only limited attention has been given to the training of extension workers in how to do their teaching job. I am pleased to learn from Dr. Joan Tully, however, that a curriculum in Extension Education is being established under her able direction in the University of Queensland.

I cannot get into all aspects of extension training in the limited time at my disposal. However, there are a few comments I should like to make which you may want to consider in your later discussions. They deal mainly with the in-service training of the field extension staff.

First, I would suggest the need for an organized and well planned in-service training programme. When I accepted my first extension appointment as a county extension agent in Furnas County, Nebraska, I thought of this job only as a more or less temporary position, which would enable me to save enough money to start farming. Many of my fellow extension agents had the same attitude toward their work. Some of them did turn to other, better-paying positions within a few years. No in-service training was available, with the exception of the occasional one-day conference with technical specialists. Since that time, extension education has become a dynamic and growing profession. Students select undergraduate courses especially designed to provide a good technical foundation. Today extension education is one of the most satisfying, although not necessarily the highest-paying, of careers in the broad fields of agriculture and home economics. As such, those of us concerned with the building of a permanent and progressive extension service need to think in terms of career development for extension personnel.

Dr. Mary L. Collings, Chief of the Extension Training Branch, Federal Extension Service, USDA, has suggested a unit approach in planning the career development of extension workers. In considering the unit approach, we might think of it in two frames of reference — first the individual as a unit and second the career stage as a unit. She suggests that in recruiting extension workers we pay close attention to the individual's background and previous training. But once we have him employed, we lose him in the group and forget about him as an individual. If we want efficient training, we will examine the individual's previous training to find areas in which he is strong and those in which he is weak. This can be done partly by review of a transcript of university credits of all extension personnel and grouping those having similar training needs. Personal inventories of training needs and performance evaluations are other tools for determining the individual's need for training. It is important to make a careful analysis of current staff needs in order to be sure that energies are concentrated on training for the most significant activities rather than being spread over a number of things that are not as important. This is one unit approach — the individual as a unit.

The other unit approach relates to career stages. Dr. Collings suggests six career development tasks.

Establishing One's Self in Job Performance

The new worker must first find a place for himself in the county (or district) and prove to himself and to the people with whom he works that he can perform the functions of an extension worker. At this stage, he is concerned chiefly with developing extension teaching skills. If we accept this as the first task, then new-worker training should be focused almost exclusively on the worker himself as a performer.

Achieving Team Status

Immediately following, or almost at the same time as the first task, the extension worker must learn how to make himself a member of the team of extension workers. At this stage, the extension worker must identify himself with other phases of extension work than his own. He must recognize his obligation to develop as much understanding and appreciation for those in agriculture, animal husbandry, youth work, as the case might be, and as much concern for the success of other staff members as for himself. Team spirit is more difficult to achieve than extension skills, but is very important.

Achieving Organization-mindedness

The third task, learning to build and work through a lay organization, is relatively easy for some extension workers and they learn it in two or three years. Some find it difficult and a few never learn it. Some extension workers see themselves as servants of the extension organization and go about doing endless chores. They are never able to step back and allow leaders to learn by doing, to make their own mistakes, and to do their own thinking; to give guidance, but not direction. It is important to train extension workers in techniques for building a sound, effective, self-perfectuating organization which will continue when experienced officers are replaced with new workers or when leaders move out of the area. We in the United States have not always been highly effective in this area of training.

Becoming Management-conscious

With the growing pressures of the job, some of our agents lose control of their destiny and sacrifice their serenity. All extension workers are equal in the amount of time given to do the job. That some are more effective than others is due in large part to management. When pressures mount, training can be directed toward helping the extension worker analyse the whole job, decide on important things to do, set up procedures for meeting different demands on his time, arrange good sequence, and delegate jobs to others.

Achieving a Professional Attitude

The fifth development task is one that is assumed when the agent takes a professional job, i.e. to become truly a professional in attitudes. But it takes time to achieve. If the extension worker has a professional attitude, he not only thinks of what he gains from being classed as a professional, but of what he contributes to professional standing for the extension service. To be classed as a professional, workers must accept for themselves the characteristics of a profession, such as:

1. a long period of specialized preparation or training
2. a code of ethics which governs individual behaviour
3. high work standards
4. willingness to accept responsibility for one's own actions
5. a self-administered organization

To be truly professional, an extension person must take an experimental attitude toward his work. He must develop insatiable curiosity as to what works and why. He must search continually for the better way, see extension work as an intellectual adventure requiring ingenuity and initiative in meeting the succession of problems which constitute the day's work. He will go out after more training for the personal satisfaction of acquiring more knowledge and for the privilege of associating with the great ideas of the world, not solely for the extrinsic values of promotions, salary increase, and the like.

Making Way for One's Own Replacements

The sixth and last career developmental task perhaps is making way for one's own replacements. In a certain sense, each experienced worker who has been given an assistant may be faced with this task at that point in his career. It is a hard task for some of our personnel. It requires that they 'move over' — so to speak — in the place of affection of county people and State workers, give up some of the preferred parts of the job, and watch someone else do 'Their job' in a different, or even a better way. If personnel learn this task of adjustment well, they not only give over some things to the new worker, they make the way smoother for the new worker to develop and do a better job than has been done before. Some of our personnel do this exceedingly well and become excellent trainer agents. Others do this task with resentment, jealousy, and bitterness. But come it must to all personnel. Surely training can help to make the learning of this task easier and less painful.

If we accept the thesis that encouraging career development is a central responsibility of extension administration, we come to the obvious conclusion that an organized in-service training programme is essential. I would not attempt to tell this group what kind of in-service training programme is best suited to Australian States. That will depend upon many factors such as education and background of extension officers, technical, economic, and social changes under way, available resources, attitudes toward training on the part of administrators and extension officers, and many others.

For some years there has been a growing realization in the United States that the Cooperative Extension Service, as a whole, should examine its in-service training policy and programme to determine whether it was of sufficient scope to serve the needs of an enterprise employing more than 14,000 professional workers. This culminated in 1956 with the appointment of a task force on in-service training by the Federal Extension Service, at the request of the Extension Committee on Organization and Policy of the American Association of Land-Grant Universities and Colleges. The assignment of this task force was:

1. To outline a comprehensive training policy and programme adequate to meet Extension's current and anticipated needs
2. To analyse and evaluate the training activities then under way
3. To prepare a set of recommendations for strengthening ongoing activities, filling gaps, and initiating such new activities as may be indicated to put Extension personnel training in line with modern industrial and educational practice, and abreast of Extension's own development requirements

This task force produced a manual which has become the basic policy statement and set of guidelines for development of in-service training in the States, and on a national basis.

Although the content of in-service training must necessarily be different in Australia from that in the United States, the characteristics of a comprehensive and adequate in-service training, as outlined in the task force report, are worth considering. These thirteen criteria prescribe the dimension of a recommended in-service training programme for extension personnel. In the opinion of the task force, an in-service training programme should be:

1. Official — supported by written administrative policy and administrative procedures.

2. Purposeful — directed toward definite purposes or objectives and providing for systematic evaluation.

3. Cooperative — planned cooperatively by the trainer and the trainees.

4. Need-oriented — based on individual needs with allowance for individual differences in abilities and interests.

5. Dynamic — directed toward improvement of the ongoing educational programme engaged in by the individual worker and the extension service.

6. Flexible — adjusted to the varied experiences of personnel changes in subject matter, methods, and procedures, and changing emphasis on programme content.

7. Comprehensive — stimulating intellectual curiosity and adding to the enrichment of life as well as developing sound, productive personnel for the organization.

8. Long-term, Continuous in Character — available throughout the professional life of personnel.

9. Developmental — directed toward answering the maturing needs of individual extension workers.

10. Well Organized — planned to achieve continuity, sequence, and integration into the experience of the learner.

11. Imaginative — forward-looking; making use of the more advanced thinking.

12. Efficient — designed to effect change and to use the best available resources, including human resources.

13. Scientific — based upon scientific information.

Conclusion

In conclusion, I offer three suggestions for the consideration of this Conference:

1. An institution as important as an agricultural extension service should have a clearly defined statement of purpose. Extension workers, at all levels, need a clear and common understanding of the basic objectives they are trying to achieve. Those who are responsible for allocation of funds need to know the purposes for which these funds are to be used, in order that they may appraise progress toward objectives and determine need for future appropriations. And most important, the people of Australia need to know the kind of service to which they are entitled. A general statement of purpose might be developed on a national basis after consultation among leaders representing the varied interests of the country as a whole. However, this general statement needs to be more precisely stated and interpreted in terms of situations in each of the States.
2. The scope of responsibility of the extension service should be reviewed from time to time, to determine whether or not the service is keeping fully abreast of the needs of rural people. Needs change with a developing economy and culture. The extension programme which was adequate in a simple agricultural economy will not necessarily meet the needs of a complex economic and social system. Extension workers need policy guidance through a statement of scope and responsibility kept up to date, to meet changing situations.
3. Orderly development of extension education as a profession requires a planned programme of in-service training. Such a programme should consider the needs of the individual and stages of career development. The development and execution of an in-service training programme is a responsibility of extension service administration, but individuals receiving training should help plan the programme.

Paper 153

POST-GRADUATE COURSE IN EXTENSION EDUCATION

By Joan Tully[*]

At the present time extension would not be classified as a professional occupation, by either practitioners or the public, in the same way that medicine or the law are considered professional occupations. Therefore, in considering extension as a profession we are looking towards the future.

Professional status is a very vague concept and hard to define. There is a whole continuum, from occupations that are undoubtedly professions, to others that undoubtedly are not. Different professions can be allocated to positions along this continuum. All the disciplines which now have developed professional status started off with a minimum of research, and initially required a very small amount of training — usually of the apprenticeship type — for their practitioners. As the disciplines themselves developed through research, the understanding of the problem area they served became more precise, the problems were seen to be much more complex, more research was needed for further understanding, and at the same time more training was needed to become a practitioner. In extension we are in the early stages of this developmental process. Little research has been done in the extension field. The standards that are required for training in our field have not been as exacting as they probably will be in the future, if extension is to develop into a profession.

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I believe we would all like to see extension moving towards professional status. If so, it might be well to look at some of the characteristics of those occupations which are now accorded such status. They have a number of characteristics in common. If medicine, engineering, and agriculture are considered, it is found that they are all based on a university discipline or a number of disciplines. They are what might be called integrative disciplines based on the pure sciences like physics, chemistry, mathematics, and the biological sciences. These integrative disciplines focus on certain areas of concern to the community. This type of integrative discipline did not develop until the basic sciences had developed to a certain stage by their own research. The integrative disciplines themselves developed by research focussed on their own problem areas. Extension obviously will be one of these integrative disciplines. Secondly, practitioners in these fields all require training at university level before they become practitioners. The third characteristic of these disciplines is that a significant number of their practitioners do post-graduate study and research and so contribute to the development of their own disciplines. These seem to be some of the characteristics of those occupations which have achieved or been accorded what might be called professional status.

So if extension is to become a profession it must:

1. develop a systematic and integrated body of knowledge and theory about the extension field, i.e. a discipline of its own
2. require university-level training in its own discipline for practitioners
3. develop post-graduate training and research in its own discipline

Australian Experience of Successful Extension

At present in Australia our knowledge of our problem in the extension field is embryonic. There are a number of success stories where individual extension workers have moved whole communities forward to more efficient farming. These successes are sometimes described as individual case studies, but they are not described within any general theoretical framework. Such a framework would allow the sequence of events to be described as sequential steps in a process. The different case studies could then be used to validate or modify the theoretical framework. This would then be the basis for learning from our experience and developing a discipline. Until this happens, experience is largely non-transferable. We know more than we know we know.

When knowledge can be systematized on the basis of theory it can be tested. A theory which works successfully in a wide variety of situations can be used to analyse success and failure in different situations.

The case studies of successful extension available have a number of elements in common. These elements are sometimes explicitly stated and sometimes implicit. They include:

1. An analysis of the situation in a farming community in:
   - *a.* agricultural terms
   - *b.* economic terms
   - *c.* social terms

   It is only when the situation in a community is understood in this way that relevant information can be brought to bear on it. In only a few cases has this analysis been based on a systematic study of the situation.
2. The participation of a large proportion of the people in the community in:
   - *a.* the recognition of the situation and its problems as analysed by the extension worker
   - *b.* the recognition that the situation can be improved by their own individual or group action

   This improvement then becomes a group goal towards which the majority in the community wish to move.

The stage is now set for effective teaching. From our own Australian experience a theoretical framework for successful extension teaching which moves whole communities towards more efficient farming is beginning to emerge.

Contributions from the Social Sciences and Avenues for Research

The knowledge, research, and experience in the social sciences suggests that it is far easier, as well as being more efficient and effective, to change people's behaviour on a group or community basis than on an individual basis. Extension's job is to change people's behaviour, yet this is a relatively new idea in extension. Research in social psychology and in sociology on group dynamics, roles, interaction, communication, and leadership can all contribute towards our knowledge of how to move a whole community towards more efficient farming.

The little we know about the structure of our rural communities suggests that it is complex and that it affects the efficiency of our extension work. We know that there are all sorts of divisions between groups in rural communities. They may be based on socio-economic factors, on history, on racial origins, on many different things. There is often hostility between these factions, cliques, or groups within rural communities. We have had a little experience with what can be done to break down such hostilities. There is a good deal of research about breaking down hostility and prejudice between groups on which we can draw. We know that very often we fail to communicate with some of these groups because they are divided in some way from the community among which they live, and these divisions interfere with our educational work for the whole community.

Sociological and sociometric studies can help us understand the complex structure of our rural communities in terms of their social divisions, leadership, influence and communication patterns, and so on. This is a field in which a great deal of research is required by extension people in cooperation with sociologists and social psychologists. It is a field for interdisciplinary research.

Situation analysis in agricultural, economic, and social terms is accepted as the necessary basis of programme planning. Techniques are available for situation analysis in agricultural and economic terms, but techniques for situation analysis in social terms are not well developed. This is another field for research.

Research in the education field provides much information about the factors which influence adult learning and about adult motivation for learning. Since extension is primarily concerned with teaching adults this research is very relevant. Extension teaches adults when there is no class. If a group is assembled it can as easily reject as accept the teaching. There is no curriculum in extension teaching except the curriculum which can be built around the problems defined by the situation analysis and recognized by the majority of the community. The purpose of extension teaching is not that people should learn, but that they should change their behaviour. From this it is obvious that extension teaching is a much more complex and difficult job than classroom teaching. Educational research has shown that adults learn more effectively when that learning is directed towards their own goals. To act on this knowledge we need to be skilled in setting up purposeful learning situations.

There are also indications that when adults share the responsibility for defining problems and evolving solutions, learning is more accurately directed to their own purposes and they are much more likely to act. This means, if extension is to educate rural people and not merely to service them with information, programmes will have to evolve from 'the grass roots', i.e. from the local level, and then be integrated higher up. At present such extension programmes as we have tend to originate at the top. If to be effective extension programmes should originate from the 'grass roots', this poses some administrative problems for extension organizations.

We need to find out if the structure of these organizations through which extension is carried out are well adapted to the educational purpose they serve.

Further organizational problems arise from the fact that many agencies, both government and private, influence the situation in which rural people live. These include the banks, commercial firms, communications, transport — roads, railways, and airports — the educational services, often the water conservation authorities, soil conservation authorities, forestry authorities, and Junior Farmer organizations. All these agencies have some influence on problems that rural people face. But their policies and activities are completely uncoordinated, except accidentally. Perhaps we should consider some way of setting up mechanisms to coordinate the activities of these organizations and agencies which impinge on the problems of farm people. If extension is to help farming communities to move towards more efficient farming to adapt to changing markets, changing levels of knowledge and changing patterns of land use, then these are some of the problems we must be concerned with and these are some of the resources that are available to us for their solution.

QUEENSLAND DIPLOMA COURSE

If extension is to face up to this situation and accept the challenge then there must be very much more research in the field and also a radical change in both the type and quality of training available to extension men. It is to meet this challenge that the Department of Agriculture at the University of Queensland is setting up a one-year post-graduate Diploma in Agricultural Extension. It is hoped that the majority of the students will be men with field experience.

The course is designed to train specialists in extension: people who will be able to lead and conduct extension programmes, contribute to extension policy, and undertake research. Students will study Rural Sociology with special emphasis on the social structure of small communities, their interaction and communication patterns, norms, roles, values, and expectations. This will be linked with the theory of group dynamics, role theory, and sociometry from Social Psychology, and other concepts from the Social Science and Education courses. Students will observe these concepts in operation in their practical work with farming communities. Such knowledge should provide students with a professional attitude towards farmers and farming communities, and enable them to obtain community support and cooperation for extension teaching programmes designed to help farmers recognize, define, and solve their own problems.

The course will help to develop the ability to promote in farming communities the confidence required to tackle their own problems. This requires that the extension officer has the knowledge and skill to develop the many talents latent in every community which are necessary to move that community forward. The Education Department of the University of Queensland has undertaken to evolve a special course in adult education to equip students to teach adults in a working situation and to evolve and use problem-centred teaching programmes.

Farm Management has been introduced into the course because it looks at a farm as a whole and considers farming problems in relation to each other and to the economics of farming. Because the students in this course will be largely employed by government departments and large organizations, it has been considered desirable that they should have some understanding of the principles of administration. Public Administration is therefore included. The Comparative Extension course is designed to give students some knowledge of the organization, administration, and philosophy of agricultural extension in other countries.

The practical work will include one vacation spent observing the work of extension officers of the Department of Agriculture and Stock in country districts. Students will be attached to various country offices and will be required to write a report on their observations. As further practical training for students, it is proposed to start some community extension work near Brisbane, with the cooperation of the Department of Agriculture and Stock. Each student will be required to work with a small neighbourhood community and help it develop an extension programme around its own problems. The programme will be a continuing one for the farming communities involved, but the students will change from year to year.

As experience is gained in training people for this important and complex service to the farming community and research knowledge is accumulated, improvements in the course will be introduced. It is hoped that this course will in fact serve the needs of Departments of Agriculture for developing extension work to meet the challenge in a way that they will see as profitable to them.

PAPER 154

EXTENSION AS A UNIVERSITY DISCIPLINE

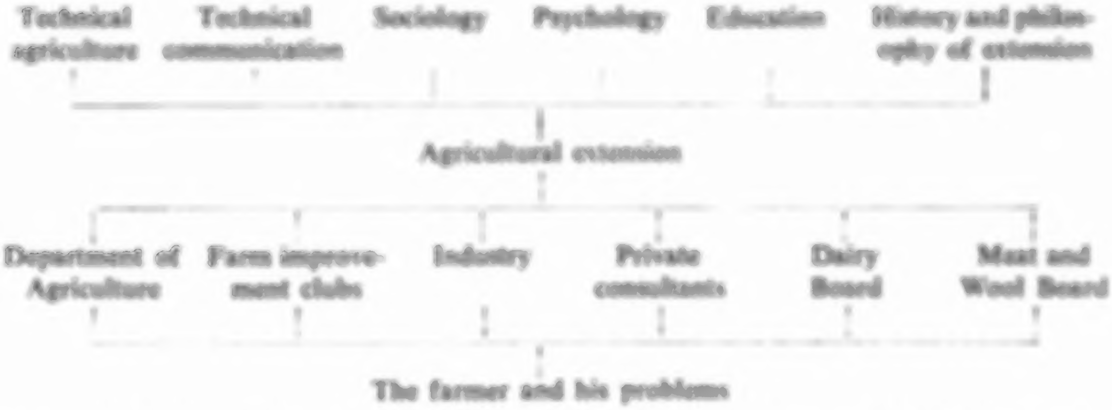
By A. H. HUGHES*

In the past, extension workers in New Zealand, and it is understood Australia, have learned their job by doing it. In recent years there has been considerable discussion in both countries concerning the training of extension workers. During this discussion it has been suggested a number of times that a course or courses in extension should be included as a part of the curriculum for a degree in agriculture. This immediately raises the question — university or 'in-service' training?

The answer to this question hinges on the abilities and qualifications required by trainees to do their job. This statement in turn raises another question. What is the job of an extension worker? The answer to this question could serve as the title to a series of papers and in order to avoid becoming involved in this paper, a simple basic answer will be given — the job of an extension worker is 'concern for the farmer and his problems'.

In New Zealand several extension services are operating. All are concerned with the farmer and his problems. Each service, however varies considerably in the type of farmer and the type of problem it is concerned with. Thus the job of the individual extension worker depends upon the service with which he is working. At the same time, all extension workers, regardless of job, use a number of common basic principles.

The position of extension can be shown by a model:


Technical agriculture
Technical communication
Sociology
Psychology
Education
History and philosophy of extension
Agricultural extension
Department of Agriculture
Farm improvement clubs
Industry
Private consultants
Dairy Board
Meat and Wool Board
The farmer and his problems

The model shows that at least six disciplines (four of them established university disciplines) are contributing to agricultural extension and that these disciplines are used by workers in at least six different services. The advantages of a common university training are obvious. One such advantage, and by no means the least, would be the free communication among extension workers in different services which could be expected from a common training in the basic principles of extension.

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* Massey College, New Zealand.

In-service training still has an important place. Learning by 'doing' cannot be entirely replaced by university training. Just as a lawyer straight from law school or a doctor just out of medical school cannot be expected to become old and trusted family law or medical practitioners, neither can extension workers straight from college be expected to become old and trusted farm advisers. They can be expected to know and understand the principles, but must learn to relate principle to practice. They must all learn the individual complexities and anomalies of their specific jobs by working alongside others who have been through the mill and from their own experience.

In New Zealand, Massey College has taught a subject, Agricultural Extension, as an option in the final year of its degree course since 1961, and has a Master's option available. The teaching of these has been the responsibility of the author. Since 1949, Lincoln College has taught a subject, Agricultural Education, which was largely descriptive. With the appointment of Mr. Alastair McArthur last year, the Lincoln course is now similar to the one at Massey, but has a different title. Subject-matter content of the Massey course is based on the disciplines shown in the model.

Technical Agriculture.—The author is fortunate that New Zealand students, by the time they reach the fourth year of the B.Agr.Sc. course, have had a strong grounding in the basic sciences, plant husbandry, animal husbandry, economics, and farm management. Thus the technical agriculture aspect of extension has been well looked after and no attention needs to be paid to it in teaching the extension course.

Communication.—Approximately twenty hours of lecture time is devoted to the principles of communication. As practical work, students are required to prepare and present talks suitable for presentation over the radio, at large and small meetings of farmers, and to take part in debates and discussion groups. They are required to write articles suitable for publication in the daily press, farm magazines, and farming journals. They are required to prepare visual aids and to present demonstrations.

Sociology.—Some fifteen hours of lecture time is spent on this section of the course. Group dynamics: formation, membership, and interaction of groups and the characteristics of rural communities are discussed. As practical work, students are required to observe and report on examples from the field which illustrate the principles discussed in class.

Psychology.—Approximately fifteen hours of lecture time is allocated to the principles of psychology appropriate to extension work. Human behaviour, needs, aims, motivation, and adjustment are topics of discussion in this area.

Education.—A review of research results and theories of learning, description of extension teaching methods (mass, group, and individual), and discussion of the advantages, disadvantages, and selection of methods to suit specific situations, occupy some forty hours of lecture time. Practical work consists of students selecting methods and preparing subject matter to cope with extension teaching-learning situations presented to them.

Philosophy.—No attempt is made to teach the philosophy of extension work as such. Rather the aim has been for a background philosophy of extension to be built up during the teaching of other sections of the course.

Organization and Function of Extension Services

Knowledge of history, organization, and function of the various extension services operating in New Zealand is handled by means of a series of projects. Students are required in their own time to study the annual reports, visit workers in the field, and, in any other ways they can, develop a working knowledge of the organization and function of the extension service of their choice. They are required to submit reports on their findings and these are combined in a composite report for distribution to each member of the class. No great emphasis is placed on this section of the course since the author believes that detailed knowledge, in this area, is the subject matter for induction training within the service concerned.

Knowledge of the organization and function of extension services overseas is gained by the students through required reading.

Difficulties Experienced in Teaching the Course

Only two major difficulties have appeared in teaching the course. Firstly there is a scarcity of information concerning extension in New Zealand. Little or no research work has been done on New Zealand extension work. References discussing aims, objectives, techniques, organization, and function are meagre in the extreme. The effectiveness or otherwise of extension work and methods used appear to be matters of individual opinion. Policy concerning extension work is almost non-existent. All this, for obvious reasons, has made teaching difficult. To some extent the existence of university teaching of extension is helping to overcome the sparsity of published information. Last November, Massey and the New Zealand Institute of Agricultural Science combined to run the first Extension Workshop held in New Zealand. Some 45 extension workers contributed to the workshop and a report was published.

The second major difficulty has been the lack of background knowledge of the 'humanities' in the students. Massey College has no arts faculty. In a multi-faculty university it would be expected that, even if students had studied no arts subjects, at least some of the humanities would have 'rubbed off' on them. Education, sociology, and psychology are all 'new books' to most agricultural students and to cover the necessary field in the time available has been quite a task. Other difficulties have appeared, but these have been due to the newness of the course rather than the subject-matter content.

PAPER 157

TRAINING IN EXTENSION SERVICE METHODS (NEW SOUTH WALES)

By H. P. BROWN*

Annually, the New South Wales Department of Agriculture has an in-service training course (11 consecutive days, in residence). This has been so since 1940. Division of Information Services organizes it, and provides the tutorial service.

Abridged sessions (5 to 6 days, in residence) are also provided by the Division for: University of Sydney 2nd-year undergraduates in Agriculture; University of New England 2nd-year undergraduates in Rural Science and Agricultural Economics; and Wagga Agricultural College.

Status of the Courses

Attendance at in-service courses is not optional. Usually 40 places are available. Divisional or Branch Chiefs nominate officers for the places. Having been nominated and a place being available to him, an officer has to attend.

For non-graduate field officers, the Public Service Board has a system of Higher Salary Grades examinations. One of four major papers is 'Extension Service Junior Farmer Club Supervisors, New South Wales Department of Education, are Methods'. This is set and marked by the Chief, Division of Information Services. The Board requires candidates to have attended the in-service training course. similarly obligated. Places are reserved for them in the Department of Agriculture course.

The abridged course for university undergraduates is so far non-examinational. The Deans have been prepared to make the course examinational, but the Division of Information Services has preferred otherwise. However, no student may graduate unless he has done the course.

Character of the Courses

The in-service courses germinated in Rural Leadership Schools conducted for the Agricultural Bureau as early as 1938 by specialist officers of the Department of Agriculture. The Leadership Schools for rural people aimed at activating individuals' latent qualities for community work and developing communicative ability. These remain basic ingredients of the extension service/methods schools.

Parts of the current course that trace back to the Leadership Schools are: every participant is rostered — to give a 10-15-minute talk, take the chair for a business session, move a vote of thanks, and participate in a debate, act as a discussion group leader, or act a role in other types of speaking. Each rostered 'involvement' is a vehicle for tutorial criticism. Importantly, critic roles are taken over gradually by the 'students'. Thus, all have the chance to develop competency in analysis of spoken-word communication.

Inherited also from the Leadership Training Schools is intensive treatment of:

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* Division of Information Services, New South Wales Department of Agriculture.

1. matters affecting efficiency within formal groups — chairmanship, secretaryship, committeemanship, meeting procedures, programming of group activities, and delegation of and acceptance of responsibilities within groups
2. advice on setting up teaching situations — lecture nights, discussion groups, educational film evenings, method and result demonstrations, short-term schools/courses, field days, and so on

This sort of leadership development, being worthwhile for the potential voluntary workers among rural people, is at least equally so for the professionals. Unskilled in these respects, professionals could scarcely expect to develop, by counselling or by example, and harness the qualities of voluntary aides in their area.

Developments

To the basic exercises with the spoken word, the in-service course has added practical work in applying:

1. visual aids — specimens, charts, diagrams, blackboard and substitute chalkboards, magnet board, flannel board, slides (and field camera usage), cine film, and episcope presentations
2. audio aids — public address systems, standard and lapel microphone usage, tape recording for radio, radio presentations, and, latterly, preparations for television

Development of written-word communicative competency is handled by lectures, illustrative matter, and workshops on 'readability' components and measurements. *Inter alia*, good use is being made of teaching devices acquired from the U.S.A. National Project in Agricultural Communications (NPAC) training courses.

Human relations study is an essential ingredient of the course. It is shaped towards an understanding of human make-up, types, motivation, how to meet people, how to get their cooperation, how to develop less gifted or less competent people as active participants; how to induce favourable attitudes towards change; and, importantly, how to improve one's self by attention to habits that may attract or detract. Appropriate tutorial aid has been drawn in, academic and practical, from universities and sales organizations. For the greater part the psychology content of the course has been worked into sessions without naming it as 'psychology', and with jargon minimized. Similarly, the sociology content of the course has been incorporated in various ways, direct and indirect, with jargon minimized. Appropriate weight has been placed on the 'informal' or 'neighbour' group and the 'key neighbour' as extension forces.

Collated information on the 'diffusion process' is now the subject of sessions helped by slides acquired from the United States NPAC training course.

Extension programming and work-plans committed to paper have had a special place in the course since 1958.

Extension evaluation methods are the subject of 'awareness' sessions. A copy of the U.S.D.A. Extension Evaluation Training School booklet has been placed in each district office for follow-up study by field officers, at least to the self-checking level of evaluation.

A convenient sampling of course-work is an examination paper to which field officer candidates were submitted in 1961. It is quoted:

Attempt not more than FIVE questions, and answer AT LEAST one question from each of the three sections of the paper.

Time allowed — Three hours.

Section I

1. List and comment on each step in a procedure you would follow when collaborating with local people to arrive at an 'extension programme' for their area.
2. The 'Facts: Implications: Action' formula is a useful discussion group procedure in extension. Discuss its merits as a means to arrive at an 'extension programme', or at least a 'campaign', and 'work-plans'.
3. 'The numerous means of exposing information to people, and of exposing people to information, vary in effect; indeed, each may have a particular role within the extension process and in a campaign.'
   Show that you understand the implications.

Section II

4. A local newspaper editor may be beset by problems likely to influence his decision on whether to give space to your press release.
   a. List some of his possible problems about which you can do something when writing the release; and
   b. What would you do whilst writing it, towards reducing his problems?
5. In an extension talk, you need to win and hold contact with your audience and to be sure you are communicating successfully.
   Show your understanding of 'contact', on the one hand, and of 'communication', on the other; and outline means to achieve your objectives as a public speaker.
6. In what ways do 'short-term' schools, of the range promoted by the N.S.W. Department of Agriculture, contribute to extension effectiveness?
7. 'The "individual contact" type of extension service may occur on a farm, in your office, in the street, on the phone, or by letter.'
   Discuss the thought that your 'individual contact' visit to a farm should begin in your office.

Section III

8. Discuss the proposition: 'That an extension service (such as that of the N.S.W. Department of Agriculture) that has an associated organization of farm people (such as the Agricultural Bureau of N.S.W.) is in a privileged position'.
9. 'An "informal" or "neighbour group" is a "delicate" but very useful medium of extension service.'
   Show your understanding of this.
10. Discuss the statement: 'The type of change concerned, AND the types of people in the community concerned, influence the rates of diffusion of the information and adoption of that change'.

Effects of the Training Courses

Most professional officers of the Department of Agriculture have been to at least one in-service school, and some have been twice. The exceptions are recent recruits, scheduled to attend shortly, and graduates who are not primarily in extension work. Most of the latter have in any case had the abridged, undergraduate course.

In general, the Department's officers have been exposed to a study of extension service, and its competencies. The effects vary. There are marked differences between men, in what they can do with extension information and methods and with people. This will always be so.

The courses have helped to evolve in New South Wales, at least among extension workers, a widespread understanding of what extension service is when well done, of what the competencies are, and of the sacrifices demanded of a dedicated extension worker.

Paper 163

DEFINING THE OBJECTIVES OF AGRICULTURAL EXTENSION — THE EFFECTS ON TRAINING AND RESPONSIBILITIES OF INDIVIDUAL EXTENSION OFFICERS

By J. C. Avery*

The objectives of agricultural extension need to be clearly defined in order that training, research, and organization of extension agencies may be efficiently planned. Two approaches to definition were published in the 'First Report of Australian Institute of Agricultural Science Subcommittee Enquiring into Agricultural Extension', viz.:

1. To communicate to the farmers advice and assistance with respect to advances in knowledge and methods in technical agriculture
2. Through the educational process:
   - *a.* To contribute to the individual development and collective welfare of people
   - *b.* To help people make adjustments in the home and on their farms to meet changing economic and social conditions and technological developments
   - *c.* To aid in the efficient production, preservation, and distribution of food and fibre
   - *d.* To aid in maintaining and increasing the productive capacity of the nation's soils, and assist in the wise use of national resources

The factors which may be involved in the objectives of agricultural extension may be stated as follows:

1. Technical advice to individual and community
2. Wider social welfare of individual and community
3. Serving national interests
4. Serving world interests

Activities under definition No. 1 are restricted to the first factor only. Definition No. 2, however, embraces all four factors. To be useful, a definition must be practical. As it is the activities of the individual extension officer which ultimately determine whether objectives can be carried out, some of the factors involved in his activities are worth considering.

Some Factors in the Individual Extension Officer's Activities

In practice, an extension officer must adjust his activities to his own physical and intellectual limitations and to the demands of the rural community he serves.

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* Victorian Department of Agriculture.

Four of the important factors determining the level and extent of his activities are as follows:

1. Size of District.—When districts are large, as is usual (e.g. author's district has 3,500 farmers), the extension officer can offer an intensive personal service, embracing comprehensive advice on subjects such as management and planning, to relatively few. Although this influence may be spread by means such as choosing 'community leaders' for the more comprehensive and personal service, there are very real difficulties. In many cases it is difficult to determine just who are community leaders, unless the extension officer can acquire an intimate knowledge of the community. 'Community leaders' are not necessarily the extension officer's best-known clients. In large districts there may be too many distinct communities, and hence too many 'community leaders' for the extension officer to handle. Meanwhile, the extension officer cannot ignore the direct requests of other farmers in his district. And finally, with large districts, the extension officer may be compelled to devote less time to personal service and more to mass media, correspondence, and telephone.

2. Complexity of Environment and Enterprise Within the District.—This particularly limits the extension officer's scope to generalize. The more complex the district, the greater the demand and need for individual advice. Some districts may be of relatively uniform environment and enterprise, which greatly reduces the intellectual demand on the extension officer and gives him greater scope for the effective use of mass media, 'community leaders', etc. The position may be similar for industry specialists, provided environment does not vary too widely. These are important factors in setting up extension districts. However, in many cases it is impossible to set districts to the ideal pattern of maximum uniformity. The larger the district, the less likely it is that uniformity will be achieved. For example, the author's district covers areas with annual rainfall varying from 20 in. per annum to 60 in. per annum and altitudes varying from 500 ft to over 3,000 ft, with a wide range of soils and enterprise, all occurring within a radius of about 40 miles.

3. Demands of the Rural Community.—It is certainly true that an extension officer can influence the type and direction of the demand for his own services. This applies more to the extension techniques he will use and problems on which he might concentrate. However, correct technical knowledge is basic whatever the extension technique chosen. The present demand of the rural community is for technical advice and, as the complexity of both the technical and economic problems facing farmers increases, the need for improved technical knowledge will increase. Even with the great multiplication of staff of existing agricultural extension agencies which would be needed to attempt a wider influence on the rural community, the demand for technical advice would remain the primary need to be satisfied. In fact, increased extension activity would increase the direct demand for technical advice. In these circumstances, the individual extension officer stands or falls on his technical knowledge. Extension training and research, and the organization of extension agencies, should be based on this premise. While it is important that some understanding of the farmer's economic and social circumstances is necessary to correctly advise on technical subjects, studies of rural sociology and sophisticated extension techniques, such as linear programming and extensive programme planning, should be ancillary to the major requirements of adequate technical knowledge and understanding of the environment.

4. *Knowledge of District and Application of Research Findings.*—It is a mistake to believe that the so-called gap between research workers and farmers can be filled merely by increasing the number of extension officers trained in extension techniques. Research results are very often not directly applicable to farms. There is often an intermediate stage in which research results must be sifted, tested, and adapted for particular environments or circumstances. This requires a technically competent extension officer who knows his district well. In many cases, it may require field applied research, which often falls to the lot of the extension officer.

THE ROLE OF NATIONAL AND WORLD INTERESTS

It may be argued that the agricultural extension officer's responsibilities are to the individual farmer, and to the world's need for increased food and fibre, but that it is the nation's problem to solve the problems of economics and distribution. Accepting this argument as a complete definition of responsibility overlooks the fact that national and individual interests cannot be completely separated. If the nation has problems, so has the individual, and vice versa. Ultimately research findings will result in increased production, and the profit of farmers is most easily increased by increasing productivity, so spreading fixed costs. But increasing the productivity of enough individuals may eventually harm them by inducing gross over-supply of their product, hence decreasing price and perhaps creating an unsaleable surplus.

The extension officer, however, by his very position, deals with individuals and their problems, and his first responsibility is to help them. He cannot do this effectively if he is an instrument of national interest in regulating production, particularly by compulsion. Nor, on the other hand, can the extension officer help the individual in the long run by encouraging farmers to increase production of unsaleable items irrespective of the national interests. The extension officer must therefore be aware of national problems and their implications to the private individual.

The problem of distribution is a national one. Many nations have, at present, considerable unsaleable surpluses of primary produce which the world either does not want or, more likely, cannot afford to buy. Such nations face a series of alternatives, which include:

1. Deliberately reducing production
2. Subsidies, tariffs, etc.
3. Finding alternative markets
4. Finding alternative and saleable products
5. Reducing internal costs

Use of the extension officer to apply the first alternative would destroy the essential relationship of mutual trust and aid between him and the individual farmer. It would certainly cut across any responsibility he may feel to increase world food supplies to a satisfactory level. The next two alternatives (2) and (3) are beyond his scope. Extension officers can certainly play a vital part in the fourth alternative by encouraging alternative forms of production, provided the individual farmer does not suffer by the change. The last alternative is also a national problem, which the extension officer cannot solve. However, he can contribute by helping individual farmers to reduce their costs and by communicating to research workers the need to investigate this aspect of agricultural production.

It is not solely the extension officer's responsibility to increase world agricultural production in order to feed and clothe the world's increasing population. This is the responsibility of the agricultural science profession as a whole. The extension officer is primarily a practical fellow. He has to try to interpret the ideal so that it can be put into practice. For this reason, he must temper his idealism in the light of the problems involved. These problems are largely that the individual farmer with whom he deals expects to make a profit, and the national problem of distribution has a good deal to do with profit-making.

Therefore, it is concluded that the extension officer's responsibilities are deeply divided, but that his first responsibility will always be to the farmer with whom he deals. He cannot completely escape his responsibility, as an agricultural scientist, to feed and clothe the world, and neither can he ignore the national dilemma of distribution. Since he cannot himself solve all the problems, he must endeavour to solve those for which he is best placed — those of the individual farmer. By efficiently carrying out this task he will be creating economic and social pressures which will lead towards the solution of world and national problems.

CONCLUSIONS

Doubt is cast on the usefulness of definition No. 2 of the objectives of agricultural extension on the grounds that it goes too far beyond:

1. The capacity of individual extension officers, especially as most are situated at present
2. The requirements of the rural community, which basically are for technical advice

Further, it is felt that too much emphasis is placed on national and world interests as opposed to the interests of individuals. On the other hand, definition No. 1 ignores community, world, and national interests completely.

Therefore, the following definition of the objectives of agricultural extension is proposed:

To communicate to individual members of the community advice and assistance with respect to knowledge and methods of technical agriculture, with due consideration of the economic and social circumstances of the individual and other people collectively.

PAPER 164

FACTORS IN THE EFFECTIVE TRAINING OF FOREIGN STUDENTS IN EXTENSION ORGANIZATION AND METHODS

By C. W. WINDERS*

Most technical agriculturalists who come to Australia as trainees are concerned primarily with subject matter, but many request that they be attached to field extension officers for a period and others ask for special training in extension principles and methods. The Queensland Department of Agriculture and Stock has provided training in extension for numerous trainees from Asia and Mediterranean countries. Experience has shown that trainees can benefit most from their training if the factors discussed in this paper are given serious consideration by the persons and authorities concerned.

DESIGNING THE COURSE

It must be accepted that, where the training is to be of a non-academic type, it is not practicable to insist upon standards of education and experience that would ensure maximum results. In these circumstances, it is important that the training be tailored to fit the trainee's qualifications as well as his needs.

Unfortunately, it is often difficult to assess a nominated trainee's educational level, experience in technical agriculture and extension, adaptability, and facility in conversing in English from brief statements prepared by the trainee and officials of his country. It is just as difficult to determine the trainee's real needs from these statements. For these reasons, little attempt is made to sort out with the trainee beforehand what aspects of the training organization's activities are likely to be most significant for him and how the training can best be arranged to suit his particular qualifications.

Organizations participating in training usually suggest a training programme based on their estimates of what is important to the trainee and what he can assimilate. This may be satisfactory enough where a trainee can be introduced to an organization and a programme in easy steps, but in many instances only a matter of hours is devoted to induction and the trainee then sets off on a tour covering perhaps thousands of miles and involving frequent new contacts with field officers and farmers. If he does not have the course and social and farming conditions in perspective, then he is likely to lose much of the possible benefit. The position is accentuated where the trainee has insufficient understanding of conversational English to enable him to appreciate what is being presented to him and to effectively engage in discussion with the people concerned.

It is considered that the training programme within an organization could be improved by giving more attention to the preliminaries. Find out as much as possible from the trainee about the social and technical conditions under which he is going to apply his new knowledge. Inform him fully of the extent, distribution, and character of the State counterpart of his particular industry, the organization of research and extension services serving that industry, the extension methods used, and the facilities for training. With this information available to both parties it should be possible, by correspondence, to draw up a proposed study course, indicating the nature, objective, and duration of each planned activity. This does not mean that the trainee is committed beforehand to an inflexible training course. If it becomes evident that an amendment of the course is desirable, then appropriate changes should be made.

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* Information Services, Queensland Department of Agriculture and Stock.

A practice adopted by the Division of Extension Research and Training of the United States Department of Agriculture in preparing foreigners for training in extension is worth considering. The trainee is provided with a list of questions for which it is suggested he should try to find answers during the course of his study. If such a list is supplied to the trainee well in advance of his departure from his homeland, it gives him an opportunity to prepare a schedule for recording desired information from each contact and each activity.

TEACHING

Every official contacted, whether giving formal training in the classroom or merely providing a brief field activity such as a farm visit, should have an appreciation of the social and technological conditions in the trainee's country and of the organization of extension activities so that he can orient his training or guidance to the needs of the trainee. This will tend to keep the feet on the ground — inspections of punch-card sorting machines and highly mechanized farms are then likely to be foregone in favour of descriptions of simple filing systems and observations on less well developed properties.

It is important that classroom teaching be done under congenial conditions. The office of the training officer, with the distraction of visitors and telephone calls, is unsuitable, and a special room with visual aids and other facilities should be set aside for training purposes.

Though it is seldom feasible, where it can be arranged group instruction is preferable to individual instruction. Not only does it give the trainees the opportunity to practise group techniques, but it saves the time of the teaching staff. Because pace and approach of a training course for Australian trainees are unsuitable for foreign trainees, mixed classes of Australian and foreign students are undesirable.

Foreign students should be given the opportunity to learn by doing. It is a common criticism that at many points of technical training (both subject-matter and extension) the trainees simply stand and watch demonstrations or listen to lectures. They learn much more, and learn it more agreeably, by doing the operation themselves. An illustration of the do-it-yourself approach is provided by an activity of a group of Indian trainees. This group stated that the preparation of instructional films was within the scope of their organization. In the classroom they were given a lecture on the principles of script writing. They then discussed the preparation of a short training film on how to run a field day on fleece improvement. Each shot in the sequence was drawn in outline on a blackboard and the commentary written. A mock field day was then conducted in a paddock, with the Indians providing the lecturer/demonstrator and the audience. The film was shot silent by a staff member and commentary was put on tape with lip synchronization by the lecturer.

Some trainees who elect to include agricultural extension in their training schedule are not engaged in agricultural extension as such and are not likely to be. They are usually office workers whose only contact with farmers is through field staff who visit farms collecting statistical data, supervising allocation of fertilizers, and so on. In such cases, the training can usefully take the form of instructing the trainee in staff training and supervision.

On a trainee's first contact with an organization it is desirable for the liaison officer to ascertain some personal information and embody it in a letter of introduction to be presented to field officers by the trainee. The letter should state briefly the trainee's background, the purpose of his visit, the name by which he wishes to be familiarly known, any particular food avoidances or religious customs to be respected, and his hobbies or other special non-technical interests. It should request the reader to assist the trainee in making accommodation and travel arrangements. In cases where the trainee has to fit in with the officer's normal office and field routine, it saves some embarrassment if the letter of introduction states specifically that the trainee understands the limitations imposed on the officer in this respect.

The introduction of personable young women into training courses almost invariably improves the climate of the course. If these women have something technical to impart, such as advice on preparation of leaflets, so much the better, but even if they are only concerned with serving and conversing at tea breaks, this is still very useful.

It is not unusual to find that a study period assigned to a technical/extension trainee with a particular organization is too long. The dead time involved could be avoided by the organizations concerned being more forthright in specifying maximum training periods. Duplication of training is another time-waster. It happens sometimes that a student is programmed for extension methods training in two different organizations and becomes bored with the inevitable duplication of some training procedures.

PREPARATION OF REPORT

A peregrinating trainee in a strange country inevitably gains some misconceptions of the matter that is being taught and his perspective becomes unbalanced. For this reason it is desirable that the subject matter be documented for him as fully as possible so that he will have authentic reference material to check against his notes and observations. From comments by trainees, it appears that most organizations in which trainees get their information while moving around a State are lax about assisting the trainee in collating and interpreting the notes he has made. It is important that someone in the organization should confer with the trainee before he leaves the organization, review his training with him, and discuss the application of the knowledge he has gained to his own country. The preparation of his final report on his studies within the organization should be undertaken by the trainee at this stage so that he will have the guidance of someone familiar with the pattern of which the trainee's observations form only a part.

SUMMARY

More attention should be given by training organizations to tailoring training to fit the trainee's qualifications and needs. Preliminary interchange and discussion of detailed information on social and technological conditions would facilitate the designing of effective programmes. Trainee participation is important in classroom training. In the field, care should be taken to concentrate on properties and extension methods not too far above the level in the trainee's country. Opportunity should be given for the trainee's report on his training in an organization to be prepared under the guidance of an officer of that organization so that perspective can be obtained.

CHAIRMAN'S CONCLUDING REMARKS

By D. B. WILLIAMS*

I want to begin my remarks by expressing my personal thanks to the members of the Organizing Committee, who over a period of many months now have been the guiding force behind this Conference. Our task has been tremendously eased by the way in which, at any moment, at any time, and there have been heavy demands on their time, we have been able to work with them and get the value of their judgement, experience, and knowledge of these matters in a way which has contributed to, and in fact determined, whatever success this Conference may have had.

It would be impertinent for me in company such as this to attempt to summarize the technical problems over which discussion has ranged. I have sat silent as specialists have brought to bear knowledge and experience on the topics which you have discussed, and have experienced an inner glow from time to time as the Conference gradually and somewhat painfully came to fulfil its purpose.

Now is the time to remind ourselves of that purpose, and to ask what each one of us has done to fulfil it. Like President Kennedy, we should ask not only what the Conference has done for us, but what we have done for the Conference.

I read to you the aims at the outset, and hope you will all read them again to help you answer the question 'What sort of a Conference was it?' You have reviewed the existing situation, you have exchanged information, and you have continued in a small way to develop a profession of extension. But the real answer to this question about the Conference cannot be found here alone. It can only be found by looking at your own conception of extension, and asking whether this Conference has increased your understanding of its nature, its scope, its significance, and its methods. To me, extension is a many-splendoured thing, and extension in action is one of the highest forms of fulfilment for any person participating in it.

You have faced many problems of communication at this Conference, as you have had to express yourself to one another. You have had to cross the borderlines of disciplines, between psychology and sociology, and between economics and agriculture. The problem of language loomed large many times. Practising extension workers and academic specialists have revealed their concepts, their ideas, and their attitudes in ways which often produced heat as well as light on the topic discussed. One important outcome of all this is a somewhat clearer image of each other's work and ideas. Mostly for the better, sometimes for the worse, we have stopped to take time to have a look at ourselves.

But it would be a mistake to expect too much in this respect from a conference of this kind. We have done many things at this Conference, but one thing we have NOT done is to convey to each other a clear understanding of each other's work problems and of our own guidelines as they are used in our everyday work. We have touched on this from time to time, and there is much about it in the papers, especially those describing the structure of the extension services in Australia. But there is still much below the surface — complex problems and attitudes which sometimes need to be ferreted out.

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* Agricultural Research Liaison Section, C.S.I.R.O.

But we could not hope in such a conference, gathering together so many groups — groups from different institutions and different disciplines — to do very much more than reveal to ourselves that there is now a wealth of experience in other places, which can be drawn on, if only we can stop from time to time to use it. For this reason proposals for smaller working groups on specific topics have the Organizing Committee's full support. Indeed we in the C.S.I.R.O. Agricultural Research Liaison Section would hope to get a lot of guidance and help from such groups in our liaison work.

It was no surprise to me that one delegate's image of extension appeared to be foggy to many others. Extension is not the only applied scientific discipline striving to find an identity in our modern age. My own feeling is that agricultural science itself is similarly struggling to clarify its own image of itself — stranded, so to speak, between the basic disciplines of botany, physics, and the like on the one hand and an applied technology on the other hand. And it's because of this difficulty of conveying and creating an image of agricultural science in this way that I think there is a role for an unscientific as well as a scientific attitude in the development of this image and the development of the concepts of agricultural science and of extension. We must bear in mind that we're working in a world which has a large component of the unscientific in it and that these unscientific attitudes, which reflect the interactions between men working in our society, mean often that the scientific method itself is not the best way of hammering out some of the policy decisions which are so necessary if our scientists are to be given means to fulfil their responsibilities in our society. We've heard the old adage that 'science is too serious a matter to be left entirely to the scientists'.

Within this general background, extension needs to establish its own professional identity and status. Professor Campbell drew attention to the similarity to education and the ministry, in that these are practising professions with few high-powered academics. But there is much also to be learned from the closely knit profession of veterinary scientists, whose professional kinship extends across the often otherwise insuperable borders between government departments, or between government and industry. Look, too, at the agricultural economists. Sixteen years ago there were no full-time university staff in this subject, and professional workers functioned as such in only two State Departments of Agriculture. Today we have two faculties, staff in each university, a flourishing professional society, a journal, and a knowledge of each other that enables us to understand Professor Campbell and Dr. Schapper and even to forgive them their excesses.

But this profession did not emerge until leadership emerged. This leadership attracted support from members and money from the Rural Credits Fund of the Federal Reserve Bank. Both are needed if a profession is to develop, but this leadership must be founded on a common professional interest and a dedication to the discipline involved in professional activity — whether it be research or educational. One of my deepest regrets about this Conference has been the lack of discipline which displayed itself at times when emotions emerged triumphant over judgement and when hurtful comments were made without any contributions to understanding.

The Organizing Committee has already conveyed to you its view that men trained as diplomates, the backbone of the extension services in Australia, have just as much need for, and can take as much advantage of, post-graduate training as the university-trained extension officer. Can our discussions at this Conference be the final nail in the coffin containing the last mortal remains of this misconception about the role of the diplomate? For years ahead he will be the backbone of our services and we should plan to train him and use him to train others so as to help him to realize his best self in this field of work. In this respect it has been most encouraging to learn from Dr. Hynes of the gradual change of entrance and scientific teaching standards planned in the courses here at Hawkesbury.

My earlier reference to the need for leadership also moves me to remark that it is such leadership which is needed to knit together — in whatsoever pattern they themselve choose — the combined efforts of government services, universities, commerce, and teaching institutions in the field of extension. Mr. Maunder's suggestion about continuous reviews of the scope and responsibilities of extension services struck a note which moves to the heart of this problem. By continuous and close contacts, whether they be in everyday work or in professional societies, a basis can be worked out for continuing reviews and assessments of how and what is being done.

Can we boil all this down to essentials? What do we need for improved extension services?

First, these depend on an adequate flow of research results expressed in a way which enables them to be used in practice. That is to say, in Australia, we not only need to continue these research programmes, we should also support them by liaison work and economic analysis, which expresses the results in ways which help farmers to overcome their everyday management problems.

The second feature of extension services requiring more care and attention is the importance of closer relationships between extension services and the rural people. Much more can be done along these lines at both the national and local levels. One aspect of this relationship is that we need to pay more attention to the effects on our research and extension services of the increased tempo in our research programmes, arising from the levies on wool, wheat, and dairy products. These levies have meant that there has been much more active participation by producers in discussions about these research programmes. And this new environment, in which primary producers are participating more actively in research planning and its application, is one of the things which may enable us first to achieve and then to maintain a better balance between fundamental research, applied research, and extension work.

Thirdly, the importance of providing career opportunities for extension officers must be stressed. This is a major and immediate need. We should face up to the need to create opportunities in our extension services, and to provide training which enables these officers to achieve a professional status comparable to the importance and demands of their destinies as professional workers in extension education.

All of this, of course, moves into an idealist's conception of what we might have. But, by setting out the features of our services in this way, we can perhaps more fully appreciate the tremendous task facing our colleagues in extension. One is moved to admire their devotion to their work, which has kept them in the field under conditions, and often with facilities, which compare unfavourably with those in the research field.

To me, these extension officers immersed in their day-to-day work, drawing on their professional training and experience, and rubbing shoulders with other groups in the rural community which provide services for farmers, alternating as they do between frustration and fulfilment, know full well that extension is, indeed, a many-splendoured thing.

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During the concluding session of the Conference, votes of thanks were adopted by the delegates expressing their gratitude to:

The Principal, Mr. B. Doman, and the staff of Hawkesbury Agricultural College, and officers of the New South Wales Department of Agriculture, for providing facilities and services for the Conference

Messrs. Penders, Maunder, and Read, who as overseas visitors contributed so much to the Conference

The Organizing Committee, for its work in the organization of the Conference

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POST-CONFERENCE REPORTS

REPORT OF THE OVERSEAS VISITORS

By J. M. A. Penders, A. H. Maunder, and H. Read

Preface

During the last 50 years, there have been dramatic and far-reaching advances in agricultural science and technology in Australia as in all of the major developed countries of the world. Through dedicated research, scientists have found new and better ways to use the riches of the soil while protecting it for the future; to produce higher yields of crops through improved plant varieties and better cultural methods; and to produce and market higher-quality livestock and livestock products more efficiently with better utilization of feed and pasture.

Other scientists have discovered more effective ways to control plant and animal pests and diseases; to fabricate new products; and to market the products of our farms at home and through the channels of world trade.

The dramatic discoveries of science, however, contribute little to the culture or economy of a nation until they are made known to the people or until they are applied in practice on the farm or in the channels of processing, manufacturing, and trade. For this reason, the growth and development of the formal and informal systems of education in agriculture have been just as significant and just as necessary as the advances in science and technology.

In Australia, as in other countries, the new knowledge of science has been the hard core of formal instruction in agriculture in the high schools, the agricultural colleges, and the universities. Similarly, this new knowledge provided by the agricultural scientists has provided the solid foundation for the informal educational systems in agriculture known as the agricultural extension services.

Actually, the growth and development of the agricultural extension services has roughly paralleled in time and in importance the growth and development of agricultural science and technology. In a broad sense, these two disciplines — science and education — are mutually dependent and equally significant. Science without application would be as meaningless as education without new knowledge.

Agricultural extension education in Australia has existed since before the start of the 20th century — since before the formation of the Australian Commonwealth. While it is not easy to trace the 'reason' for the origin of extension work in Australia, we can perhaps safely assume that the origin was directly related to the quest for new problem-solving knowledge on the part of a relatively few enlightened farmers.

Regardless of the reason, farmers, scientists, agricultural leaders, and government officials quickly recognized the cultural and economic advantages of, and even necessity for, developing an educational system or systems aimed at maintaining the closest possible educational liaison between the scientist and the farmer. The resulting growth and development of the agricultural extension services in Australia as in other countries, therefore, became something of an inevitable natural phenomenon based upon existing rural cultures, physical environment, farm organizational structures, and political systems.

During the week of August 12–17, 1962, at Hawkesbury College, scientists, extension workers, university and college leaders, agricultural business and industry delegates, and government officials met together at the Australian Agricultural Extension Conference. The conference provided the environment for leaders in all fields of agriculture to share common views and experiences and to consider in open forum the opportunities for the future growth and development of agricultural extension education in Australia.

It was the privilege of the authors of this report to participate in that important conference and to share common experiences with respect to agricultural extension education in Australia, New Zealand, the United States, and Europe. That participation provides the basis for this report. It is intended as an interpretative analysis and a consensus of our views in the light of our experience with extension services in Europe, and in the United States and other countries.

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IDENTIFICATION OF THE PURPOSE AND SCOPE OF THE EXTENSION EDUCATIONAL SYSTEM AT STATE AND NATIONAL LEVELS

An effective extension system results from the coordinated efforts of many people within and outside the system. The first requisite for such coordination is a common understanding of the purpose and scope of responsibilities of the extension service. Common understanding requires that the purpose and scope be recorded and available for study and reference by all who are interested or concerned.

Extension work in Australia is conducted largely for the benefit of primary producers by many individuals and administrative units, with branches of State and Territory Departments of Agriculture having central responsibility for this and other agricultural services. Universities and various public, commercial, private, and other agencies carry on extension, educational, and related activities.

In most States there does not appear to be any agency concerned exclusively with extension education. In this situation, general agreement on the purpose and scope of extension education could provide a foundation for any needed adjustment in organizational structure, collaboration between agencies, staffing, financing, programming, and in fact all aspects of extension administration. This could and should lead to the development of extension services as definite entities and to recognition of extension education as a highly respected profession.

Statements of purpose and scope might well provide Australia's, and more specifically each State's, answer to such questions as the following:

1. What is the basic purpose or goal of extension? To implement government policy with respect to agriculture? To ensure adequate supplies of food and fibre at reasonable cost? To improve income and levels of living for all rural people? To help people use scientific knowledge in solving their problems? Or something else?
2. How wide should the scope of responsibility of the extension service be? Is it concerned only with improved production of commodities or should economic aspects such as farm management, marketing, and distribution be given attention? Is it concerned only with present primary producers or should the training of future farmers be included? Should problems of rural living be given attention? Should extension officers confine their activities to informal education or should they be expected to perform various services for farmers, make inspections, or be responsible for administration of operational programmes of their Department of Agriculture?
3. Who are the clientele of the extension service? Commercial farmers? All farmers? Farm families? Farm labourers? Rural industries? Urban people who need to know more about the role of agriculture in Australia?
4. What is a desirable relationship between extension workers of the State Departments of Agriculture and research workers, faculties of agriculture in colleges and universities, other public and private organizations interested in working with farmers, and organizations of farmers themselves?

These and many other questions need to be sorted out so that all people will understand the role of the extension service. Agreement on the philosophy, purpose, and scope of extension education will provide a useful foundation for further development. Development of a statement of the purpose, scope, and responsibility of extension education might well be undertaken by the extension committee proposed by the Extension Conference.

Because extension operates in a dynamic agricultural situation, countries such as the United States have found it necessary to examine periodically the scope and objectives of extension education. This has led to changes in emphasis to meet the changing structure of agriculture and rural living. Australia may find it desirable to do the same.

THE DEVELOPMENT AND RECOGNITION OF EXTENSION AS AN EDUCATIONAL PROFESSION

Whereas extension education has been an important part of the science–education–practice scheme in Australia for more than half a century, extension workers, for the most part, have not identified themselves with an 'extension profession'. They have indicated a need for such identification, however, and the future of extension work in Australia will be stronger when such a profession is recognized. Historical experience and sound logic support this point of view.

Just as teaching in the elementary and high schools, the colleges, and the universities is identified with the profession of education so should the interpretation and communication of knowledge on an informal basis be identified with a profession of extension education. The benefits from such professional development and recognition are many and varied.

Most important, perhaps, would be a more rapid evolvement of a 'spirit of purpose' and a renewed professional dedication to the purposes and objectives of the extension educational system. Emphasis on standards of performance would be generated from within the profession instead of only from official administrative leadership. Means would be found from within the profession for improved communication between extension workers and between the extension profession and other agricultural professions. Professional self-improvement schemes also would be more likely to emerge from within the profession, and there would be greater inducement and encouragement for young people to consider career opportunities in agricultural extension work.

More subtle, perhaps, but equally important is the fact that self-identification with a recognized profession offers the individual an essential kind of satisfaction and cultural compensation impossible to measure in terms of shillings and pence.

The evolvement of a profession assumes the criteria of common educational experiences and high academic standards for its members. A profession that 'anyone can enter' regardless of background, education, training, or capabilities is no profession at all. The educational standards for an extension profession must be as clearly identified and as completely accepted as the educational standards for the legal or medical professions. In the same manner, the profession of extension must recognize professional ethics and demand high minimum standards of performance from its members just as the agricultural science professions demand high standards of research performance from scientists. It should be expected too that in time the extension profession would embrace common ideals and concepts relating to informal systems of education in agriculture.

Equally important to the recognition of an extension profession, as with any profession, should be the development of professional literature based upon philosophies, experiences, and research. The vast body of knowledge relating to extension education in Australia must be continually collated, recorded, catologued, and disseminated as guides for present and future generations of extension workers.

PROVISIONS FOR IMPROVED SYSTEMS OF PRE-SERVICE EDUCATION FOR EXTENSION WORKERS AND EXPANDED AND IMPROVED OPPORTUNITIES FOR PROFESSIONAL SELF-IMPROVEMENT THROUGH SOUND PROGRAMMES OF IN-SERVICE TRAINING

The successful extension worker must possess both a knowledge of agriculture and a knowledge of educational and communication methods. He must have or know where to find the information that farmers want and need, and he must also know how to communicate this information to farmers and their families. He must wear the hat of an education specialist as well as that of an agriculturalist.

Historically in Australia, as in most countries, extension workers have been educated almost entirely in the field of agriculture. This is true of the diplomates from the agricultural colleges as well as the agricultural science graduates of the universities. Most have sound training in 'what to teach', but few have training in 'how to teach'. This imbalance in the education of future extension workers is being recognized in Australia. Hawkesbury College has indicated that greater attention will be given in the future to programmes that satisfy the educational needs of extension workers. Several universities have short introductory courses in extension at the undergraduate level and others are considering introducing them. The University of Queensland has initiated a post-graduate diploma course in agricultural extension. Other colleges and universities may be considering similar programmes.

Ideally, the total educational needs of future extension workers should be recognized by the colleges and universities at both undergraduate and post-graduate levels. Programmes at the undergraduate level will, of necessity, have to be limited in scope. But undergraduates going into extension work would benefit greatly from at least a single course that covered such topics as the philosophy, organization, methods, and administration of extension. Such a course should place strong emphasis upon all techniques of communication, including person-to-person, group, and mass methods.

Extension workers should also have the opportunity to return to a university for post-graduate work in agricultural extension after a period of experience in the field. This opportunity should be equally available to both diplomates and agricultural science graduates. Here again the broad field of agricultural extension should be emphasized, and the courses should be specially constructed to meet the professional needs of the extension workers. They should consist of more than the mere 'borrowings' of knowledge from the related social sciences of psychology, sociology, anthropology, administration, and communications. Whereas the knowledge from these and other social science disciplines must be made an integral part of courses in agricultural extension, the true development of agricultural extension as a profession will not be realized until extension education is recognized as a discipline in its own right.

Carefully designed courses of undergraduate and graduate training in extension by the colleges and universities should provide the solid educational background for professional extension workers. But there is growing recognition that these courses must be supplemented by expanded and improved efforts in the area of in-service training. Such in-service training programmes should be designed to eliminate the voids left by pre-service education and to make sure that extension workers are kept up-to-date on current developments in agriculture and extension educational methods. These programmes should be developed in close coordination with the workers themselves and should be top-level demonstrations of sound educational principles. They need not always be confined to physical gatherings of extension workers at a conference, workshop, or seminar. Much in-service training can be accomplished through the use of training letters, workbooks, handbooks, and correspondence-type courses.

All in-service training programmes, however, should be closely correlated and coordinated with the programmes of undergraduate and post-graduate education. Whenever possible, efforts should be made to enlist the assistance and cooperation of the colleges and universities in the in-service training programmes. Representatives from commercial organizations also can often be of invaluable assistance. It should seem logical, for example, to invite the assistance of newspaper and radio representatives with courses designed to instruct extension workers in the effective use of press and radio methods.

The growing importance of in-service training in extension in the United States was recognized in the mid 1950s by the establishment of a National Task Force on In-service Training from within the American Association of Land-Grant Colleges and Universities. After three years of study and investigation, which included two national surveys, the Task Force published a basic manual titled 'A Guide to an Inservice Training Program for the Cooperative Extension Service'. This manual reviews the current status of extension training in the United States and considers opportunities for improved training in the future.

Considerable emphasis on extension training in Europe has been generated by the International Training Centre on Extension Methods at Wageningen, Holland. This Centre has sponsored numerous training conferences and seminars on extension organization, administration, and methods.

While there is need to give increased attention to extension training in the areas of organization, administration, personnel development, and methods, the need will continue for continued in-service training of extension workers in the technical fields of agriculture also.

THE DEVELOPMENT OF EDUCATIONAL PROGRAMMES BASED UPON THE INVOLVEMENT OF LOCAL PEOPLE AND THEIR PROBLEMS

An extension programme has been said to consist of the sum total of all activities of the extension service in the area concerned. In this sense, all Australian extension workers have programmes. But an extension programme, to be effective, must involve many people — the extension officer himself, his administrative superiors, his sources of information, other agencies and individuals concerned with its execution, and, most important of all, the rural people affected by it.

Systematic development of long-term programmes and short-term plans of work can be a very useful educational experience for all of these people if they participate in the programme planning process. Furthermore, the involvement of such people in the planning process results in programmes better adapted to local situations.

Although programme planning is necessary or desirable at all levels — locally, regionally, State-wide, and nationally — the local extension programme is the foundation of effective extension education. It is here, on individual farms and in rural communities, that extension education produces change. We, as extension educationalists, succeed or fail in proportion to the success or failure of the local programme. The suitability of a local extension programme can be measured to a great extent by the following criteria:

1. Is it based upon careful consideration of the existing situation? There are many factors affecting agriculture and rural life. These include the many physical and biological factors of the farm itself, the farm family, and off-farm influences. Not all of these factors in a situation can be known and assessed. But the more essential facts considered the better the result will be. Channels of communication and the sociological factors in the situation are equally important in planning extension education programmes.
2. Have key people concerned with or affected by the programme been involved in the programme development process? Not all people can be involved. The problem is to ensure the involvement of (a) those whose help is needed in programme development and execution and (b) an adequate proportion of the people affected by the programme.
3. Is the programme directed toward the solution of a few high-priority problems whose solution will meet a recognized need? Concentration on problems in order of recognized priority where the results can be seen contributes to efficiency.
4. Are objectives — both short- and long-term — clearly stated? A clear statement of objectives provides a bench mark against which to measure accomplishment at a later date.
5. Has a plan of work been developed indicating what is to be done over a stated period of time; where, when, how much, and who is responsible for each aspect of the work?
6. Is the programme educational? Will it result in change in knowledge, skills, or attitude according to the purposes stated in the objectives?
7. Does the plan provide for periodic evaluation to determine progress and effectiveness of the programme in accomplishing its objectives?
8. Is the plan of work flexible to allow for unforeseen changes in the situation?
9. Is the programme feasible in relation to human, physical, and financial resources of the community and of the extension service?

Extension programme development should be considered as a teaching technique as well as a method of systematizing extension work. It can be carried on as an integral part of the process of extension education in an area, district, or community. The main problems in Australia are (a) the development of background information and (b) the involvement of people at all levels of planning — local, regional, State, and national. Each of these problems can be dealt with on a simple basis in the beginning — using available facts and involving a few people. More facts can be collected as the need becomes apparent and more people may be involved as the skill and confidence of the extension worker increases.

ENCOURAGEMENT OF PROGRAMME DIRECTION TOWARDS THE WHOLE-FARM APPROACH IN COORDINATION WITH SPECIALIZED TECHNICAL ASSISTANCE

Extension workers generally agree that their educational programmes of the future must embrace more than the provision of information and assistance to help farmers solve technical problems of a specialized nature.

In the past, extension workers have directed most of their efforts toward this specialized problem-solving approach. Such efforts have been designed to provide information that will permit the farmer to produce more meat and wool with more efficient use of better feed. This specialized problem-solving information is still needed, and always will be needed.

Currently, however, there is growing realization that extension may be able to contribute even more when a systematic approach is made to the efficient operation of the whole farm enterprise. With this approach, consideration is given to the efficient combination of all farm resources — land, labour, capital, and managerial abilities — and to the integration of all subject-matter information relevant to the farm 'situation'. The farm situation is analysed not in terms of a specific enterprise, but in terms of a combination of enterprises. The extension worker and the farmer, for example, are concerned not only with how to produce meat and wool more efficiently, but whether to produce meat and wool at all.

Farm management specialists in agricultural economics have developed considerable competence in the 'whole-farm' approach to extension education, and their leadership in this field should be encouraged. It would also be desirable for all extension workers to become familiar with the concepts and methods of the approach. Then the dairy extension specialist appraises the farmer's dairy problems in terms of the whole farm enterprise. The same would be true of the sheep and wool specialist, the horticulturalist, and the agronomist.

The whole-farm approach to extension education should not be considered as an alternative to the specialized approach, but as a complement. Both are needed now and will be needed in the future. The extension worker trained in the whole-farm approach should work in close coordination with the specialists in the various technical and socio-economic fields of agriculture.

THE COORDINATION OF EXTENSION EDUCATION AMONG THE STATES AND THE COMMUNICATION OF IDEAS BETWEEN STATES AND WITH COMMONWEALTH ORGANIZATIONS

The Agricultural Extension Conference at Hawkesbury College provided the environment for extension workers from all States to discuss common problems and share common experiences. Whereas agricultural problems may vary from one

State to the next, there proved to be a broad band of common interest among extension personnel from all States. The continuing search for more effective educational methods, for example, is not unique to New South Wales or Queensland. The problem of finding the most satisfactory approach to in-service training does not restrict itself to Western Australia or Victoria. Tasmania and South Australia are not alone in their efforts to find the best way of keeping extension workers in the field currently informed about agricultural research discoveries.

There is a common bond of interest, too, between the efforts of the Agricultural Research Liaison Section of C.S.I.R.O. and the various State extension services in making sure the latest scientific discoveries are interpreted and made available to all Australian farmers.

It is also accepted that many of the most troublesome Australian agricultural problems do not recognize State boundaries. Sheep diseases and pests do not confine their attacks to Victoria and Queensland while skipping New South Wales and South Australia. Similarly, cobalt deficiencies have much in common regardless of the State where they appear. In many cases, a coordinated national educational programme among all States may prove more effective than uncoordinated individual State approaches to the same problem.

It would seem desirable, therefore, for increased attention to be given to the establishment of some scheme or system or some kind of facility that would permit and encourage greater coordination of extension educational efforts between and among the various States. This same system or facility should encourage increased communication and cooperation among the States and between the States and Commonwealth organizations.

In the United States, there are two facilities which provide the machinery for beneficial cooperation and coordination among the States. The Federal Extension Service of the United States Department of Agriculture performs a valuable coordinating role and serves as a liaison among the States. Cooperation and coordination is also achieved through the American Association of Land-Grant Colleges and Universities. This Association provides the structure for regional organizations through which problems common to a region are considered and approached.

The Organization for Economic Cooperation and Development (OECD) provides a similar facility for cooperation between and among the countries of Europe. The United States and Canada are also official members of OECD, and this membership adds an international dimension to the facility.

COOPERATION WITH COMMERCIAL INDUSTRIES, FARM ORGANIZATIONS, COMMERCIAL MEDIA, AND PRIVATE ADVISERS ON EDUCATIONAL PROGRAMMES THAT HAVE COMMON OBJECTIVES

Just as there is need for some system or facility to encourage coordination and communication between States, so is there need for close coordination and communication with the educational efforts of commercial industries, farm organizations, commercial media, and private advisers.

The farmer in every State looks to many people and organizations for information and new knowledge about farming. If the information is sound and helpful, it makes little difference whether it comes from an extension worker, a representative from a seed or tractor company, a bank official, or a private adviser whom he pays for advice and information. It is most essential, however, that the advice and information a farmer receives from various individuals and organizations be accurate and consistent in its application to his farming situation. Unfortunate confusion and distrust can be the only result, for example, if an extension dairy specialist and a representative from a creamery or dairy company suggest conflicting information to solve a farmer's dairy production problem. Similarly, information on chemical control of weeds should be the same whether the information comes from an extension worker of the State Department of Agriculture or a private farm adviser.

Systems of close liaison, therefore, need to be established and maintained, first between agricultural research workers who provide the sources of information and all individuals, agencies, and organizations who directly or indirectly make the information available to farmers. Secondly, some system or facility is also needed to ensure the same close liaison among all groups and agencies involved in extension work, whether public, commercial, or private. To be effective, such liaison systems should operate within each State as well as on a Commonwealth level.

ACHIEVING EFFECTIVE BALANCE IN THE USE OF EXTENSION EDUCATIONAL METHODS

As stated earlier, the effective agricultural extension worker must be a specialist in both agriculture and extension methods. Unfortunately, in the past, too many extension workers have had to learn extension methods by experience, and primary dependence has been placed upon person-to-person and person-to-group methods. There has been less dependence and less confidence in strictly group methods or in the mass methods of press, radio, and television.

Too often it is mistakenly assumed that person-to-person methods are 'natural' and require little skill. The same mistaken assumption often is made in using person-to-group methods. The competent and experienced worker knows that talking with an individual farmer or listening to his analysis of a farm problem or situation demands skill on the part of the extension person. Presenting information before a group of farmers at a meeting, at a field day, or on a tour also demands skill of a different kind.

In many ways, working with groups of people in an educational environment where there is continuous communication between the members of a group requires the most skill on the part of the extension worker and can result in the most satisfactory educational experience. The method is designed to encourage multi-channel communication among the members of the group leading to problem-solving from within the group rather than through the advice of an expert or specialist in the field. There are unlimited opportunities for use of the group method in extension, and it deserves greater exploitation.

Similarly, the many and varied opportunities for using the mass methods of press, radio, and television have not been fully exploited by extension workers in the various States. There needs to be more study and understanding of the particular role that newspaper articles can play in getting information to farmers and their families. The same is true of radio and television broadcasts. At the same time, the limitations of mass methods need to be fully understood.

In practice, the combination of educational methods should be incorporated in the plan of work designed to carry out an educational programme. Once the situation has been analysed, problems identified, and an educational programme designed to carry educational information to farm people, comparable attention must be given to the selection of techniques and methods to carry out the educational programmes. Which phases can best be covered by newspaper articles? Which by radio? What role should television play? How much use should be made of newsletters? How many meetings should be held? What kinds of meetings are best? From answers to these and other questions will evolve a 'communications plan' to make the most efficient use of the time and financial resources of the extension worker.

USING TECHNIQUES OF EXTENSION EVALUATION TO IMPROVE THE AGRICULTURAL EXTENSION SERVICES

The farmer faces an array of complex decisions on the most efficient combination of resources on his farm. Similarly, the extension worker is confronted with just as complex a decision-making process with respect to the effective use of his knowledge, time, and other educational resources.

Unfortunately, there is more scientific research directed at helping the farmer make his decision than at helping the extension worker make his. Much more research has been done on how to produce meat and wool profitably than on how to effectively transmit knowledge to farmers on meat and wool production. With the present lack of research and evaluation there is no basis for knowing whether one system of extension organization and administration is or could be better than some other system. There is no way to measure the success or failure of an educational programme. There can only be guesses with respect to the kind of pre-service and in-service training programmes extension workers should have, and it is impossible to determine the effectiveness of the training efforts now being made.

Without research and evaluation, the extension worker must rely on experience and instinct as a basis for selection or rejection of one educational method over another. There is no way of knowing why some farmers adopt approved practices while others do not; why some seek the advice of an extension worker while others avoid it. It must be admitted that effective extension research and evaluation can only be carried out by qualified personnel with sufficient funds and time to do a creditable job. But it must also be appreciated that there are in each State competent and qualified personnel to carry out such research on a modest initial basis. It should not be necessary to establish a major research and evaluation branch or facility in each State Department of Agriculture. Many of the basic problems could be approached on a national cooperative basis if techniques for joint cooperation could be worked out.

MAINTAINING CLOSER LIAISON BETWEEN EXTENSION SERVICES AND THE COLLEGES AND UNIVERSITIES OF AUSTRALIA

The colleges and universities of Australia share the responsibility for the formal education of young people in agriculture beyond the high school level. They have trained nearly all present extension workers and will provide the educational programmes for all future extension workers.

The extension services of the various States share the responsibility for initiating and carrying out the continuing programmes of informal education for farm people, including those diplomates and agricultural science graduates who have returned to the farm as a chosen occupation.

It is at the colleges and universities that future extension workers should be first introduced to the disciplines of the social sciences, including psychology, sociology, anthropology, social psychology, and economics. But it is on the job in the extension services that the diplomates and graduates make practical application of the social sciences. It would seem logical, therefore, that ways be found to maintain the closest possible liaison between the various extension services and the colleges and universities of Australia. The colleges and universities should look to the extension services for guidance in improving educational programmes for future extension workers and both should work together in evaluating the effectiveness of these programmes once the workers are on the job.

Similarly, the extension services should benefit from the cooperation and assistance of the colleges and universities in designing and carrying out improved in-service training programmes for extension workers as well as the more formal post-graduate diploma courses and programmes.

The third area of close liaison and cooperation embraces extension research and evaluation. University scholars in the social science fields have much to contribute to the scientific research approach to extension problems. At the same time, the vast field of extension education should offer unlimited challenges to all research workers in the social science disciplines.

THE FUTURE

Agriculture is rapidly moving into an era even more dynamic than the period since the end of World War II. The less developed countries of the world are rushing to improve their agricultural production capacities in the fight against hunger. The Common Market of Europe has added a new dimension to world trade. Science continues to find better ways to produce, process, and market agricultural products.

The dynamics of tomorrow's agriculture provided a stimulating backdrop for the Agricultural Extension Conference at Hawkesbury College. There seemed to be an awareness that extension education too was entering a new era and that educational leadership in the future would be dependent upon a willingness to frankly and candidly ask and answer these questions:

1. Can improvements be made in the organization and administration of the extension services in Australia to meet the demands of the future?
2. What additional measures can be taken to ensure that the extension services attract high-calibre staff members and provide for continued professional improvement and advancement?
3. Should new directions be given to our methods of problem analysis and programme planning?
4. Has balance been achieved in the use of the various extension methods, and are we using each method most effectively?
5. What benefits can be expected from soundly conceived programmes of extension research and evaluation?

So long as extension workers in Australia can maintain the spirit of objective analysis that prevailed at the Extension Conference, the future development of extension education in this country is unlimited.

REPORT OF THE ORGANIZING COMMITTEE

I. INTRODUCTION

The 1962 Australian Agricultural Extension Conference was held at Hawkesbury Agricultural College on 13–17 August 1962. The aims of the Conference were as follows:

1. To review the existing situation, methods, gaps in our knowledge, and problems of agricultural extension
2. To encourage the exchange of information between extension agencies and between extension workers
3. To contribute to the development of the profession of agricultural extension with a view to improving current extension practice

This report is designed to provide a review of the main topics discussed at the Conference in accordance with the stated aims of the Conference, and to set out some of the more important features of the Australian agricultural extension services in 1962.

The 167 papers submitted at the Conference have now been released for publication. These papers provide an invaluable source of information about different aspects of the present position.

Attendance

Conference was attended by 102 residential delegates from the organizations listed in Table 1.

We have benefited very greatly from the active participation at the Conference of three specialists in extension who were invited to Australia to participate in it. Their contributions to our knowledge and to the discussions at the Conference have been invaluable, and we desire to record our appreciation of their efforts to assist us. The overseas participants were:

Mr. A. H. Maunder, Federal Extension Service, United States Department of Agriculture, U.S.A.

Mr. J. M. A. Penders, Agricultural Advisory Services, Ministry of Agriculture, Netherlands.

Professor Hadley Read, Illinois Cooperative Extension Service, University of Illinois, U.S.A.

TABLE 1

State Departments of Agriculture—		
New South Wales	11	
Victoria	8	
Queensland	5	
South Australia	5	
Western Australia	5	
Tasmania	7	41
Other State authorities		12
Universities		11
Commonwealth Departments		8
C.S.I.R.O.		9
Professional societies, industry, and commerce		16
Overseas delegates		5
		102*

* An additional 20 non-residential delegates attended particular sessions.

Our appreciation of the support of the Commonwealth Extension Services Grant, the Federal Reserve Bank, and of C.S.I.R.O., who provided financial support for these visits, is gratefully recorded.

II. CONFERENCE PAPERS AND DISCUSSIONS

THE EXISTING SITUATION

Government Extension Services

Particular attention is drawn to the valuable group of papers prepared by the appropriate State extension authorities, describing the existing structure and functioning of extension services. The Department of Primary Industry submitted a paper outlining Commonwealth financial support for extension services. The papers included contributions from Papua and New Guinea, Northern Territory, and, for comparative purposes, New Zealand, as well as from the Agricultural Research Liaison Section of C.S.I.R.O.

Papers submitted to the Conference described some of the outstanding characteristics of extension services in Australia:

1. Extension services in Australia are primarily a function of government departments, principally State Departments of Agriculture. This has influenced such aspects of organization as the extent of the association of extension services

with regulatory functions of government, the scope and purpose of the services, problems of staff recruitment and training, and career prospects of extension officers.

2. Extension as a profession is relatively unrecognized in Australia as compared with research and with extension in other countries. As yet formal training in extension is undeveloped in Australian universities and colleges. The majority of full-time extension officers are diplomates from agricultural colleges, although an increasing number of university graduates are being employed in extension.
3. The research–extension relationship in general is often oversimplified by being considered as solely one of C.S.I.R.O. research and State Department of Agriculture extension. This overlooks the important research contributions from other organizations, as well as the role of State Departments in research. The research–extension relationships between States and within States, and between organizations and within organizations, are equally of major importance.
4. The broad-scale extensive nature of Australian rural industries has created special problems of communication and transport in remote areas. Problems associated with pasture and livestock management systems, and the social structure of rural communities in remote areas, have involved unique extension situations, and have also created special problems in maintaining professional contacts and knowledge for extension officers located in such areas.
5. Numerous delegates drew attention to the shortage of personnel in their existing extension services.

Commercial Firms in Extension

In the post-war years there has been a striking increase in the number of professional agricultural scientists employed in commercial firms engaged in the sale of farm services such as fertilizers, seeds, machinery, and pesticides.

The employment of appropriately trained agricultural scientists in industry, applying principles and techniques of extension, backed by the organization of each commercial industry, means that much new technical information is being conveyed to the rural community through commercial enterprise. Firms use mass media, group methods, and individual farm visits on a huge scale.

Representatives of commercial firms at the Conference drew attention to the growing importance of commercial activities in extension, and to their desire to coordinate their activities with appropriate extension authorities. Delegates expressed the hope that closer bonds would develop between government services and commercial firms engaged in extension, as well as with communication channels such as the rural press and broadcasting and television stations.

In this respect, plans for in-service training and for post-graduate training of extension officers might well take account of developments that have occurred in commerce, and of the desire of industry to have access to training facilities of this kind.

Farm Management Clubs

There is now a movement in Australia towards farm management clubs to provide personalized advice to each farmer member. These clubs have been established to meet a demand for an individual whole-farm advisory service, and are paid for by farmers themselves.

There is widespread recognition that the clubs complement the established government extension services, rather than replace any of their functions. The emergence of clubs which followed recognition of the value of trained advisers as demonstrated by government services has thrown new light on the scope and responsibility of government extension services, and especially on the need for extension services to provide all available assistance to club advisers, who in turn advise individual farmers on an intensive scale.

Attention was drawn at the Conference to problems of providing staff suitably trained as advisers for farm clubs, and to the need for staff of these clubs to have access to training facilities provided from time to time for extension officers. Such courses may be devoted to technical information, or to extension methods, but in either case farm club officers may well have something to contribute to the training as well as being able to benefit from it.

PROBLEMS OF EXTENSION

Scope and Purposes of Agricultural Extension

The extension services in any one country reflect historical, geographical, economic, and social influences, and each has variously had its own origins in farmer organizations, vocational teaching institutions, research institutions, government services, or combinations of these.

Analyses of extension services in overseas countries, especially since World War II, reveal changes in organization and operation to meet the needs of a changing world. Analyses of the reasons for and effects of such changes provide a background for a clearer understanding of the Australian extension services. These studies of overseas developments draw attention to the need for comparative studies in Australia.

It was argued that the purposes of extension need to be defined and agreed upon by all participants in the extension process, including the rural people. Until these purposes are defined there is no agreed base on which questions such as these may be answered: Should extension services aim only at providing specialist technical information or advice or at adopting the farm management adviser approach? Should agricultural extension provide rural community development stimulation? Should extension services have a general practitioner base, with the local extension officer as the integration point for subject-matter specialities, or have direct farmer contact by subject-matter specialists?

EXCHANGE OF INFORMATION

Much of the discussion at this Conference was in general terms because of the wide range of diversity of the topics in the papers submitted and in the professional background of participants, and because this was the first occasion when delegates from so many different organizations had met together to discuss extension. In presenting our report we want to stress that many of the topics raised require more intensive study by specialist groups.

Comparative Extension

Conference delegates heard from Mr. Penders a comprehensive description of developments in the organization and functioning of extension services in European countries with special emphasis on the relation between agricultural extension and agricultural education.

Article 41 of the Treaty of Rome specifies that one aim of the European Economic Community is to promote the coordination of agricultural extension, education, and research in and between the member nations.

Mr. Penders reported gradual changes in the work of the international training centre on extension at Wageningen where, under the sponsorship of F.A.O. and of O.E.E.C., facilities for training by short courses have been established since 1951. The success of this cooperative venture points to the opportunity here in Australia to establish training courses in extension, drawing on specialists from several States, universities, etc., for the courses, and providing for exchange of experience and viewpoints by officers from the several States. Such courses might also be open to participants from other countries.

Definition of Extension

Conference delegates discussed various definitions and considered that the following definition of extension established a basis for understanding its nature:

> Agricultural extension is a service or system which assists the rural people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living, and lifting the social and education standards of rural life.

There was, however, wide divergence of opinion as to whether extension was as all-embracing as this definition implies.

Extension Programme Planning

Conference delegates were stimulated by the papers and discussion on overseas and local developments in the field of extension programme planning. Programme planning was recognized by delegates as one of the weakest and least developed aspects of extension in Australia.

Delegates were interested in the New South Wales and Tasmanian experiences and the progress in programme planning in Papua New Guinea.

The discussion of overseas developments in programme planning was led by Mr. A. H. Maunder, an acknowledged international leader in this aspect of extension work.

Mr. Maunder stressed that planning gives meaning, system, and efficiency to our efforts and keeps them directed towards specific educational objectives and priorities. Without the guidance provided by written planned programmes, there is often a tendency for extension work merely to attempt solutions of day-to-day problems. Planned programmes allow the extension service to allocate its resources to deliberate priorities and facilitate the evaluation of the effectiveness of extension. The systematic development of programmes begins with a situation analysis from which sound information, problems, and resources become known. The second step of organization for planning is to involve the people concerned — extension workers, specialists, and farmers — often as a formal or informal committee. The programme planning process, as the third step, identifies the wants and needs, selects priorities, and determines the objectives. The planned programme is then distributed in written form to all participants, including specialists and farmers' representatives. The fifth step, the plan of work, is the allocation of extension resources and selection of the particular combination of extension methods to be used, with a realistic calendar for these activities. The implementation of this plan of work then leads to the planned final step, the evaluation of the programme in terms of the original stated objectives. This appraisal is then part of the analysis of the (changed) situation for the succeeding programme.

Evaluation

Underlying much of the discussion at the Conference was the realization that evaluation of extension was still relatively undeveloped in Australia. Indeed, queries were raised as to whether it is true to claim, as is often claimed, that research findings find their way into practice 'slowly', or 'too slowly', and that a wide gap exists between derivation of new knowledge and its application in practice.

Some attention was given to extension evaluation, what form it might take, and what type of specialist was best suited to conduct it. There was general agreement that evaluation was an essential part of programme planning and development; informal evaluation by the extension officer himself had a most important role, additional to evaluation studies by social scientists.

Mass Media

Discussion of this topic was introduced by Professor Hadley Read's paper in which he stressed the following aspects of mass media in extension work:

1. Extension comprises an educational system where our objectives are to increase the level of knowledge and change the behaviour of the people in our audience.
2. This educational system involves the continuous application of the communications process, and the mass media comprise one of three channel groups (the others are group methods and personal contacts) which are available for getting information to people.
3. To be effective, the use of mass media must be incorporated into all stages of extension planning and development.
4. To use mass media methods effectively, extension workers must be keen students of the communications process and develop skills in mass media techniques and methods. To improve these skills, we need to provide better

communications training programmes either at the college or university level or as a part of our in-service training operations or both.

5. We must initiate and carry out soundly conceived programmes of communications research in order to improve our use of mass media methods.

An overriding impression from the mass media session was the need for more communications training so that professionally trained officers qualified to write and present material in radio, television, films, and press would be available in greater numbers.

The Australian Broadcasting Commission and some State extension services have devoted much thought to the extension opportunities provided by television. There is a unique opportunity for establishing, at this early stage, research programmes which analyse the impact of television in extension. These evaluation and impact studies might include careful observations of reactions in rural areas by extension officers themselves, as well as studies by specialists in social science research.

Group Methods

The papers (describing group methods, including Field Days and Demonstrations) and discussions showed that for group methods, as for many other aspects of extension work, extension workers have largely 'learnt by doing' with little organized effort to learn from the research results of the basic social sciences. Supporting disciplines including social psychology could be drawn on to increase the availability of basic information to strengthen group extension.

Delegates stressed the need to specify aims and purposes of extension, then to plan programmes based on specified objectives, and then to use group methods in such a way that each contributes to the specified objectives.

DEVELOPING A PROFESSION

Developing a Profession of Agricultural Extension

Possibly at no stage of the Conference were the differences in viewpoints, attitudes, and backgrounds of the participants more apparent than at the session devoted to training extension officers. Discussions revealed many different ideas of the functions and purposes of extension officers. These differences led to different attitudes toward pre-service and in-service training.

There was one issue on which there was considerable agreement. This was the need for practising extension officers to have access to more specialized and intensive training. There have been rapid advances in scientific knowledge, technology, and extension education, and extension officers need to be exposed to all three phases. Demands from farm people for advice have increased; these demands have increased quantitatively, but have also deepened qualitatively, requiring more knowledge and skill on the part of extension officers.

It was acknowledged that established procedures for in-service training did much to expose extension officers to the benefits of further study and training. Many of these courses of necessity concentrate on technical subject matter, and on administration. There has been steady development of in-service training in extension methods. But the need was also stressed to create opportunities for practising extension officers to spend periods of leave for extension studies.

Basic Disciplines Supporting Extension Services

One session at the Conference was devoted to discussions of papers submitted by specialists in the social sciences. Papers contributed by psychologists, sociologists and economists each drew attention to research and to studies of human behaviour with special application to extension.

Delegates expressed varied views of the role and purposes of extension. Some viewed its task as one of achieving 100% adoption of a particular practice; others saw the extension services' role as one of problem-solving on behalf of farmers; others felt that the ultimate role is to assist farmers to make decisions which are to their advantage; again, others considered the extension services to have an even broader responsibility to educate rural people, with guides to decision-making as one component of this educational procedure.

There was recognition, perhaps for the first time for many delegates, that the findings of the social sciences are not reaching the extension authorities, and that more mutual exposure to one another's problems, as between social scientists and extension officers, would be rewarding and beneficial for each.

III. CONCLUSIONS

We believe that the following measures reflect the needs of the present situation, and present them in the belief that they would contribute to extension work.

Because extension is an educational system, training in the principles and practices of education as well as in the agricultural sciences is needed.

Some training in the social sciences should be available for those students who are training for careers in extension work.

Facilities should be established in Australia for courses in extension open to graduates of universities and of agricultural colleges.

Establishment of graduate schools at universities would encourage research in extension, and in the supporting disciplines.

The Conference revealed that there is a wealth of experience to be drawn upon within our own existing extension services, in other places where extension is being done, and in other disciplines. We consider that more effort to exchange experience and knowledge would be of great mutual benefit.

Accordingly, we have set out below certain specific recommendations. These are an attempt to provide specific means of:

1. Providing for more interchange of knowledge and experience between different State extension services
2. Strengthening the professional bonds and providing for more mutual assistance between extension officers and workers in other appropriate disciplines
3. Contributing to the development of a profession of agricultural extension in Australia

IV. RECOMMENDATIONS

Recommendations drawn from the Conference discussions and endorsed by the Organizing Committee are as follows:

1. Standing Committee might give consideration to the formation of an Australian Extension Committee, to act as a subcommittee of Standing Committee, with the terms of reference such as the following:
   - *a.* to act as a forum for the exchange of information between States about all phases of extension in Australia
   - *b.* to establish study groups and encourage research on particular aspects of extension and thereby to facilitate exchange of information and the development of knowledge about extension (Some subjects might include definition of terms used in extension, the role of television in extension, the collation of information from the social sciences relevant to extension, and ways and means of training extension leaders on a cooperative basis.)
   - *c.* to decide on the need for and, if it approves, to recommend to Standing Committee the establishment of a newsletter and/or a journal for extension officers
2. Facilities for training extension officers in extension in Australia should be expanded through post-graduate and post-diplomate courses at agricultural colleges and/or universities. Such training needs to be open to college diplomates as well as university graduates.
3. Efforts should be made to strengthen the links between government extension services and commercial firms engaged in advisory work. In this respect, attention is drawn to proposals discussed at the Conference to establish, in each State, extension liaison committees.
4. Expansion of facilities for extension research should be supported at this stage of the development of Australian extension services.

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